Vol. 1048 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

November 6, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Apr. 13, 1984. *Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 3, 1981 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	4,784 through 4,786
Utility Patents	4,297,746 through 4,298,990

Reissue Patents based on the above identified patents. No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,571,545, Re. S.N. 361,815, Filed Mar. 25, 1982, Cl. 200/291, TOGGLE SWITCH WITH PIVOTAL SHORTING BAR BRIDGING STATIONARY CONTACT PINS, AND SLIDABLE CAM BLOCK DETENT MEANS, Gerald L. Gherlein, Owner of Record: *Eaton Corp., Cleveland, Ohio,* Attorney or Agent: Daniel J. Sammon, et al., Ex. Gp.: 243

3,977,421, Re. S.N. 626,404, Filed June 29, 1984, Cl. 134/006, BUFFING MACHINE, Burke R. Fallen, Owner of Record: *Inventor,* Attorney or Agent: Tim L. Burgess, Ex. Gp.: 133

4,336,814, Re. S.N. 626,190, Filed June 28, 1984, Cl. 131/291, PROCESS FOR EXPANDING TOBACCO, Larry M. Sykes, et al., Owner of Record: *Philip Morris, Inc., New York, N.Y.,* Attorney or Agent: Arthur I. Palmer, Jr., et al., Ex. Gp.: 332

4,337,950, Re. S.N. 628,596, Filed July 6, 1984, Cl. 273/426, CIRCULAR BOOMERANG, Kenneth N. Gidge, Owner of Record: *Inventor,* Attorney or Agent: Kenneth E. Darnell, Ex. Gp.: 334

4,340,073, Re. S.N. 625,404, Filed June 28, 1984, Cl. 131/291, EXPANDING TOBACCO, Roger Z. de la Burde, et al., Owner of Record: *Philip Morris, Inc., New York, N.Y.*, Attorney or Agent: Arthur I. Palmer, Jr., et al., Ex. Gp.: 332

4,340,433, Re. S.N. 627,735, Filed July 3, 1984, Cl. 148/016, METHOD OF HEAT TREATING ARTICLES, Brian Harding, Owner of Record: *Can-Eng Holdings, Ltd.*, Attorney or Agent: Harvey D. Fried, et al., Ex. Gp.: 111

4,349,072, Re. S.N. 620,987, Filed June 15, 1984, Cl. 166/250, METHOD AND APPARATUS FOR CONDUCTING LOGGING OR PERFORATING OPERATIONS IN A BOREHOLE, Pierre C. Escaron, et al., Owner of Record: *Schlumberger Technology Corp., New York, N.Y.*, Attorney or Agent: H. N. Garrana, et al., Ex. Gp.: 356

4,421,250, Re. S.N. 621,868, Filed June 18, 1984, Cl. 222/95, BIN FOR FREE FLOWING MATERIAL, Timothy C. Bonerb, et al., Owner of Record: *Inventors*, Attorney or Agent: G. Franklin Rothwell, Ex. Gp.: 311

4,444,874, Re. S.N. 627,017, Filed July 2, 1984, Cl. 430/409, PHOTOGRAPHIC ELEMENTS CONTAINING DIRECT-POSITIVE EMULSIONS AND PROCESSES FOR THEIR USE, Robert A. Silverman, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.*, Attorney or Agent: Carl O. Thomas, et al., Ex. Gp.: 156

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Erratum

"All reference to Patent No. 4,469,355 to Steven W. Neff of Iowa for 'CONNECTOR FITTING FOR ELECTRICAL BOX' appearing in the Official Gazette of Sept. 4, 1984, should be deleted since no patent was granted."

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-308,747 (4,461,167). PSYCHROMETER FOR MEASURING THE HUMIDITY OF A GAS FLOW.

SN 6-364,290 (4,466,923). SUPERCRITICAL CO2 EXTRACTION OF LIPIDS FROM LIPID-CONTAINING MATERIALS.

SN 6-546,220 (4,468,346). MONOCLONAL ANTIBODIES TO PORCINE IMMUNOGLOBULINS.

SN 6-626,850. TEMPERATURE ADAPTABLE TEXTILE FIBERS AND METHOD OF PREPARING SAME.

SN 6-638,826. MICROEMULSIONS FROM VEGETABLE OIL AND LOWER ALCOHOL WITH OCTANOL SURFACTANT AS ALTERNATIVE FUEL FOR DIESEL ENGINES.

SN 6-638,827. PROCESS TO PRODUCE DURABLE PRESS LOW FORMALDEHYDE RELEASE CELLULOSIC TEXTILES.

DEPARTMENT OF COMMERCE

SN 6-567,451 (4,461,680). PROCESS AND BATH FOR ELECTROPLATING NICKEL-CHROMIUM ALLOYS.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-349,313 (4,468,466). SILVER STAINS FOR PROTEIN IN GELS - A MODIFIED PROCEDURE.

SN 6-427,857 (4,468,383). DIMERIC ENKEPHALINS.

SN 6-636,261. INTACT GENE AND METHOD OF EXCISING AND CLONING SAME.

DEPARTMENT OF THE AIR FORCE

SN 6-105,043 (4,461,574). ENVIRONMENTALLY INDEPENDENT FIBER OPTIC ROTATION SENSOR.

SN 6-304,123 (4,463,262). THICK FILM RADIATION DETECTOR.

SN 6-313,861 (4,463,443). DATA BUFFER APPARATUS BETWEEN SUBSYSTEMS WHICH OPERATE AT DIFFERING OR VARYING DATA RATES.

SN 6-324,347 (4,463,436). PROGRAMMABLE DIGITAL TEMPERATURE CONTROLLER APPARATUS.

SN 6-341,459 (4,462,560). AIRPLANE TAKE-OFF SYSTEM.

SN 6-350,493 (4,459,803). VARIABLE INLET VANE ASSEMBLY FOR A GAS TURBINE COMBUSTION.

SN 6-361,019 (4,461,006). SYNCHRONOUSLY PUMPED MODE-LOCKED SEMICONDUCTOR PLATELET LASER.

SN 6-361,021 (4,462,103). TUNABLE CW SEMICONDUCTOR PLATELET LASER.

SN 6-376,891 (4,457,174). ULTRASONIC INSPECTION OF COMPOSITE MATERIALS.

SN 6-386,488 (4,461,570). METHOD FOR DYNAMICALLY RECORDING DISTORTION IN A TRANSPARENCY.

SN 6-394,039 (4,461,955). ISOLATED LOAD SWITCHING WITH SURGE SUPPRESSION.

SN 6-418,117 (4,462,562). SELF-DEPLOYING AFTERBODY APPARATUS FOR AN EJECTION SEAT.

SN 6-418,951 (4,460,514). METHOD FOR THE PREPARATION OF POLY (CARBONYL FLUORIDE) OLIGOMERS.

SN 6-431,436 (4,461,756). SINGLET DELTA OXYGEN GENERATOR.

SN 6-433,561 (4,461,145). STALL ELIMINATION AND RESTART ENHANCEMENT DEVICE.
SN 6-433,597 (4,462,563). SIMPLE NONRESTRICTIVE ARM RESTRAINT SYSTEM.
SN 6-452,605 (4,462,286). PORTABLE SLOTTING DEVICE.
SN 6-478,581 (4,462,975). SYNTHESIS OF PENTAFLUOROTELLURIUM HYPOFLUORITE.
SN 6-607,087. RADIO FREQUENCY PROBING APPARATUS FOR SURFACE ACOUSTIC WAVE DEVICES.
SN 6-607,094. CONDUCTOR STRUCTURE FOR THICK FILM ELECTRICAL DEVICE.
SN 6-612,776. IN VIVO DERMAL ABSORPTION METHOD AND SYSTEM FOR LABORATORY ANIMALS.
SN 6-618,288. NOISE JAMMER DISCRIMINATION BY NOISE SPECTRAL BANDWIDTH.
SN 6-619,240. RADIATION MEASURING SYSTEM USING TRANSISTOR FLUX SENSORS.
SN 6-622,047. DRAFT CABIN PRESSURIZATION CONTROL SYSTEM TESTER.
SN 6-622,613. MODULAR DETONATOR DEVICE.
SN 6-622,614. TURNAROUND CONTROL FOR MECHANICALLY SCANNED RADAR ANTENNAS.
SN 6-623,581. FAST ENVELOPE DETECTOR WITH BIAS COMPENSATION.
SN 6-623,667. METHOD FOR MEASURING HAZE IN TRANSPARENCIES.
SN 6-623,873. ZERO ADHESION SYSTEM.
SN 6-623,905. REFLECTOR ANTENNA HAVING SIDELOBE SUPPRESSION ELEMENTS.
SN 6-624,846. CLUTTER GENERATOR FOR USE IN RADAR EVALUATION.

DEPARTMENT OF THE ARMY

SN 6-626,520. EXTRACTOR FOR SPRING-LOCK PIN CONNECTORS.
SN 6-628,096. SHOCK ELECTROMECHANICAL ENERGY CONVERTER WITH PERMANENT MAGNET.
SN 6-638,183. BROADBAND TRANSVERSE FIELD INTERACTION CONTINUOUS BEAM AMPLIFIER.
SN 6-639,054. MOVING OBJECT DETECTION SYSTEM USING INFRARED SCANNING.
SN 6-639,558. FREQUENCY STABILIZING LASER.
SN 6-639,755. FREQUENCY SYNTHESIZER.
SN 6-640,184. TRANSVERSE FIELD INTERACTION MULTIBEAM AMPLIFIER.
SN 6-640,265. METHOD OF MAKING A POROUS CARBON CATHODE, A POROUS CARBON CATHODE SO MADE, AND ELECTROCHEMICAL CELL INCLUDING THE POROUS CARBON CATHODE.
SN 6-642,850. LIGHTWEIGHT COMPOSITE LAUNCHER POD.
SN 6-644,165. PROGRAMMABLE OPTICAL SENSOR.

DEPARTMENT OF THE INTERIOR

SN 6-488,479 (4,468,973). REMOTE SEQUENTIAL GAS SAMPLER FOR BLASTING AREAS.

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name:
"ACME PREMIUM SUPPLY CORP."

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "ACME PREMIUM SUPPLY CORP." used by Acme Premium Supply Corp., a corporation organized under the laws of the State of Missouri, located at 4100 Forest Park Blvd., St. Louis, Mo. 63108.

the application states that the trade name is used in connection with the following merchandise manufactured in China, Taiwan, Korea and Hong Kong: stuffed toys, inflatable toys, plastic toys, novelty items, hats, caps and figurines.

Before final action is taken on the application, consideration will be given to any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Nov. 23, 1984.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Rm. 2417, Washington, D.C. 20229.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,
Sept. 18, 1984. *Director, Entry Procedures and Penalties Division.*

PATENT NOTICES

Certificates of Correction for the Week of Nov. 6, 1984

Re. 31,588	4,427,815	4,441,580	4,452,079
4,043,995	4,428,855	4,441,655	4,452,088
4,305,002	4,428,979	4,441,707	4,452,459
4,307,615	4,429,069	4,442,608	4,452,554
4,329,955	4,429,149	4,443,085	4,452,802
4,374,395	4,429,767	4,443,325	4,452,918
4,385,497	4,432,318	4,444,024	4,452,925
4,388,756	4,432,737	4,444,283	4,452,932
4,391,133	4,433,760	4,444,538	4,453,159
4,396,608	4,433,891	4,444,658	4,453,170
4,398,441	4,434,369	4,444,744	4,453,409
4,399,264	4,434,787	4,444,765	4,454,571
4,400,394	4,435,552	4,445,001	4,454,949
4,410,438	4,436,093	4,445,081	4,455,221
4,411,478	4,436,531	4,445,534	4,455,264
4,412,998	4,436,544	4,445,858	4,455,265
4,414,248	4,437,021	4,446,131	4,455,351
4,416,734	4,437,399	4,446,332	4,455,443
4,417,066	4,437,890	4,446,444	4,456,942
4,418,210	4,438,118	4,446,852	4,457,150
4,418,919	4,438,261	4,447,820	4,457,287
4,420,547	4,438,355	4,447,905	4,457,446
4,420,933	4,439,662	4,449,063	4,457,453
4,422,666	4,439,666	4,449,130	4,457,596
4,423,019	4,439,768	4,449,834	4,457,976
4,425,075	4,440,038	4,450,860	4,458,075
4,425,618	4,440,057	4,451,669	4,459,466
4,427,099	4,440,775	4,451,675	
4,427,250	4,440,856	4,451,691	
4,427,643	4,441,363	4,452,047	

Disclaimer and Dedication

4,261,979.—*Pierre Jolles,* Paris; *Jean Florent,* Boulogne-Billancourt; *Jean Lunel,* Paris; *Denise Mancy,* Charenton and *Daniele Migliore-Samour,* Kremlin-Bicetre, France. NOVEL WATER-SOLUBLE COMPOUNDS DERIVED FROM EXTRACTS OF STREPTOMYCES STIMULOSUS, PROCESS FOR THEIR PRODUCTION, THEIR USES AS IMMUNOLOGICAL ADJUVANTS AND COMPOSITIONS CONTAINING THEM. Patent dated Apr. 14, 1981. Disclaimer and Dedication filed Apr. 30, 1984, by the assignee, *Acence Nationale De Valorisation De La Recherche (Anvar).*

Hereby disclaims and dedicates to the Public the entire term of said patent.

Dedication

4,264,800.—*Merlin R. Jahnke,* Woodbury, and *Alfred D. Nelson,* Stillwater, Minn. MICROWAVE OVEN WINDOW. Patent dated Apr. 28, 1981. Dedication filed Aug. 13, 1984, by the assignee, *Minnesota Mining and Manufacturing Co.*

Hereby dedicates said patent to the Public.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 1, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-25-82
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-09-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	6-19-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	6-18-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-23-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	12-14-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-13-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	5-09-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-06-81
DESIGN, GROUP 290—K. L. CAGE, Director	2-22-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	3-12-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-18-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	11-30-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-04-82

Expiration of patents: The patents within the range of numbers indicated below expire during September 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,339,206 to 3,344,432, inclusive

Plant Patents ..... Numbers 2,764 to 2,769 inclusive

REEXAMINATIONS

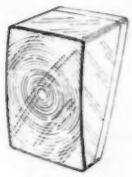
NOVEMBER 6, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

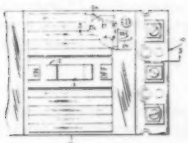
B1 Des. 236,535 (269th)
VEHICLE LIGHT
Harold H. Larsen, Long Beach, and Robert E. Oehring, Norwalk, both of Calif., assignors to Bates Industries, Inc.
Reexamination Request No. 90/000,492, Jan. 23, 1984.
Reexamination Certificate for Patent No. Des. 236,535, issued Aug. 26, 1975, Ser. No. 405,745, Oct. 12, 1973.
Filed Jan. 23, 1984, Ser. No. 405,745
U.S. Cl. D26—28

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of the claim is confirmed.



B1 3,671,890 (270th)
MANUALLY OPERABLE MOLDED CASE CIRCUIT BREAKER WITH SPECIAL TRIP TESTING MEANS
Keith W. Klein, Simsbury, and Herbert M. Dimond, West Hartford, both of Conn., assignors to General Electric Company
Reexamination Request No. 90/000,527, Mar. 19, 1984.
Reexamination Certificate for Patent No. 3,671,890, issued Jun. 20, 1972, Ser. No. 129,915, Mar. 31, 1971.
Int. Cl.[3] H01H *73/12*
U.S. Cl. 335—22

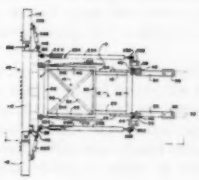


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–5 is confirmed.

1. An automatic electric circuit breaker comprising:
a. a casing of molded insulating material having a generally planar cover portion with a manually operable handle projecting through an opening therein for operating said circuit breaker between ON and OFF conditions;
b. a trip bar in said casing movable from a normal position to a releasing position to cause automatic opening of said circuit breaker;
c. a trip-testing button rotatably supported in said insulating casing, said testing button including an outer portion having a head accessible for operation externally of said insulating casing and an inner portion within said insulating casing;
d. said inner portion of said trip testing button including a first elongated arm portion extending radially from the rotational axis of said button and terminating adjacent said trip bar;
e. said test button being rotatable from a normal position to a tripping position to cause said elongated radial extension of said inner portion to engage said trip bar and cause tripping of said circuit breaker, and
f. resilient means in said casing resiliently resisting rotation of said button from said normal position to said tripping position and returning said button to said normal position after rotation to said tripping position.

B1 4,356,645 (271st)
VARIABLE WING PLOW BLADE AND MOUNTING STRUCTURE THEREFORE
Gordon Hine, Logan, Utah, and Robert D. Mathis, Canoga Park, Calif., assignors to Logan Manufacturing Co., Logan, Utah
Reexamination Request No. 90/000,416, Jul. 6, 1983.
Reexamination Certificate for Patent No. 4,356,645, issued Nov. 2, 1982, Ser. No. 151,461, May 19, 1980.
Continuation of Ser. No. 916,613, Jun. 19, 1978, Pat. No. 4,249,323.
The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.
Int. Cl.[3] E01H *5/06*
U.S. Cl. 37—281



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–9 are cancelled.

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 6, 1984

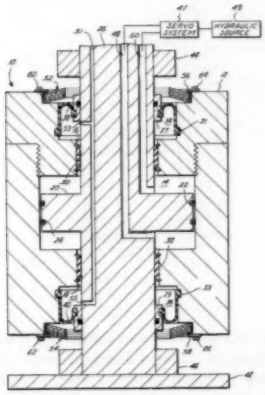
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T104,801
VIBRATOR MASS ACTUATOR DESIGN

Marek L. Rozycki, 10210 Forum West, Houston, Tex. 77036

Filed Jul. 30, 1982, Ser. No. 403,888
Int. Cl.³ G01V *1/135*
U.S. Cl. 181—119
1 Sheets Drawing. 11 Pages Specification



A linear actuator **10** for use as a seismic vibrator includes a reaction mass **12** having an internal cylinder **14**, and containing a double acting piston **20** to which are attached upper and lower pistons **26** and **28**. Hydraulic fluid under pressure is applied alternately to the upper and lower faces of piston **20** to reciprocate it in alternate strokes relative to the reaction mass. Rolling diphragm seals **38** and **40**, secured between piston shafts **26, 28** and reaction mass **12**, prevent external contamination from reaching laminar seals **30** and **32**. Shafts **26** and **28** include enlarged portions **44** and **46** that are contactable with nests of conical springs **52** and **54**, mounted at the top and bottom of reaction mass **12**, at the displacement limits of piston shafts. Said conical springs absorb energy and limit rebound between the reaction mass and the piston shaft.

T104,802
NONIONIC ALKYNYL COMPOUNDS AND APPLICATIONS THEREOF TO SILVER HALIDE PHOTOGRAPHY

Richard L. Parton, c/o Eastman Kodak Company, Rochester, N.Y. 14650

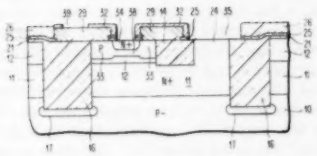
Continuation of Ser. No. 510,146, Jul. 1, 1983, abandoned. This application Feb. 21, 1984, Ser. No. 581,938
Int. Cl.³ G03C *1/28*
U.S. Cl. 430—600
No Drawing. 82 Pages Specification

A photographically useful alkynyl compound is disclosed which is nonionic under aqueous alkaline photographic processing conditions. The alkynyl compound is comprised of an alkynyl group attached to a methylene group through a divalent chalcogen or an imino group. The methylene group is activated by an electron withdrawing substituent. The alkynyl compounds are useful in direct positive internal latent image forming emulsions as nucleating agents and in negative working surface latent image emulsions to increase speed and/or contrast.

T104,803
SELF-ALIGNED PROCESS FOR PROVIDING AN IMPROVED HIGH PERFORMANCE BIPOLAR TRANSISTOR

Cheng T. Horng, 6396 Gondola Way, San Jose, Calif. 95120

Continuation of Ser. No. 284,365, Jul. 13, 1981, abandoned. This application Feb. 16, 1984, Ser. No. 580,962
Int. Cl.³ H01L *29/72, 27/04, 29/06*
U.S. Cl. 357—34
5 Sheets Drawing. 34 Pages Specification



A bipolar transistor structure formed in a monolithic silicon semiconductor substrate of p type having a planar surface comprising: a subcollector of n type formed in the substrate; an epitaxial layer of n type formed on said planar surface of said substrate and also having a planar surface, the epitaxial layer having a thickness in the order of 1.0 to 1.5 micrometers; an enclosed deep recessed oxide isolation trench enclosing a transistor structure area of the substrate and the epitaxial layer, the enclosed deep recessed oxide isolation trench having a depth extending from said planar surface of said epitaxial layer through the subcollector region; a shallow recessed oxide isolation trench, the relatively shallow recessed oxide isolation trench being wholly enclosed by the deep recessed oxide isolation trench and intersecting the deep recessed oxide isolation trench at two spaced apart points to divide said transistor structure area enclosed by the deep recessed oxide isolation trench into first and second areas, the first and second areas being electrically connected one to the other by the subcollector region;

a shallow depth emitter region formed in a limited portion of the first area of said epitaxial layer, the emitter region having a depth in the order of 0.1 micrometers;

an active base region formed beneath said emitter region in the limited portion the first area of said epitaxial layer, the active base region having a width in the order of 0.1 micrometers;

an inactive base region surrounding the emitter region and active base region, the inactive base region being wholly contained within the first area of said epitaxial layer;

an emitter-base junction contained within said first area of the epitaxial layer and extending to the surface of the epitaxial layer;

a composite layer of silicon dioxide and silicon nitride having a width of approximately 0.2 to 0.3 micrometers, the composite layer being positioned on the planar surface of the epitaxial layer over the surface juncture of said emitter-base junction, the silicon dioxide having a thickness of

approximately 500Å and the silicon nitride layer have a thickness of approximately 500Å;

the second area of the epitaxial layer containing a collector reach through, the shallow recessed oxide isolation trench isolating the collector reach through from the inactive base region;

a layer of polysilicon p type on said planar surface of the epitaxial layer and in physical and electrical contact with the inactive base region, the polysilicon layer extending over a portion of said enclosed relatively deep recessed oxide isolation trench; and,

a base contact physically and electrically contacting the portion of the polysilicon layer which extends over the enclosed deep recessed oxide isolation trench.

REISSUES

NOVEMBER 6, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,721

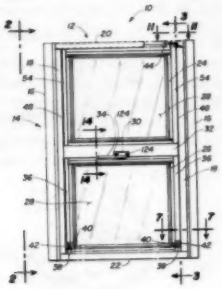
INSULATED MULTIPLE COMPONENT SINGLE PLANE BUILDING STRUCTURE PORTAL CLOSURE

Maurice E. Sterner, Jr., Spring Grove, Pa., assignor to Product Design & Development Inc., York, Pa.

Original No. 4,324,072, dated Apr. 13, 1982, Ser. No. 136,060, Mar. 13, 1980. Application for reissue May 25, 1983, Ser. No. 498,055

Int. Cl.³ E05D *15/20*

U.S. Cl. 49—129 **18 Claims**



13. A building portal closure comprising, in combination,

an encasement frame defining a generally rectangular opening, said encasement frame including a pair of spaced parallel glazing frame slide members defining two opposed sides of the encasement frame, said slide members having a pair of parallel channels in their opposed inwardly directed surfaces cooperating to define inner and outer glazing frame support tracks extending substantially the full length of said slide members,

a plurality of rectangular glazing frames supported in said encasement frame for sliding movement along said tracks in said slide members, said plurality of glazing frames being adapted to be supported in edge-to-edge coplanar relation in a first plane by one of said support tracks,

guide block means slidably mounted in each elongated channel of the other of said support tracks for movement along said slide members,

a sash support pin carried by each said guide block means for movement therewith with each said sash support pin projecting from its associated elongated channel into said generally rectangular opening,

a pair of elongated channel members having one end portion rigidly mounted one on each of two opposed side edges of one of said rectangular glazing frames, said elongated channel members being located equally distant from corresponding end of the associated side edge of said glazing frame, and extending one adjacent each slide member in a direction transverse to said channels therein,

said elongated channel members each defining a guide channel slidably receiving one of said sash support pins whereby said one glazing frame and said support pins are constrained to move together along said slide members,

said one glazing frame being manually movable between said first plane and a second parallel plane by sliding said guide channels over said pins and being movable along said slide members with said pins when in said second plane, and

manually operable lock means for releasably retaining said plurality of glazing frames in said coplanar relationship.

Re. 31,722

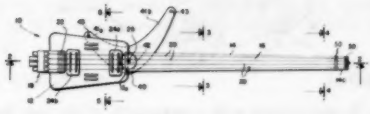
STRINGED MUSICAL INSTRUMENTS

Ned Steinberger, 106 Seventh Ave., Brooklyn, N.Y. 11215

Original No. 4,192,213, dated Mar. 11, 1980, Ser. No. 942,937, Sep. 18, 1978. Application for reissue Mar. 11, 1982, Ser. No. 357,065

Int. Cl.³ G10G *5/00*

U.S. Cl. 84—327 **23 Claims**



1. A stringed musical instrument comprising a body, a neck portion extending from said body, said neck including a nut and a fingerboard, tuning machines, said tuning machines extending from said body portion opposite said neck portion, support means for supporting said instrument, said support means pivotally engaging said instrument, said support means pivoting at the center of gravity of said instrument, and said neck of said instrument weighing approximately no less than 2.5 pounds, said neck having an average cross section without a fingerboard of approximately 1.25 inches, and said neck deflecting no more than 0.09 inches when said instrument is supported [to] *at* its center of gravity and with a five-pound weight depending from said nut of said neck.

Re. 31,723

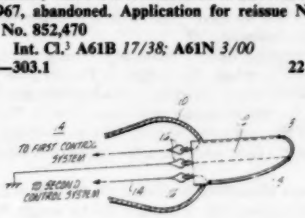
SURGICAL CUTTING INSTRUMENT HAVING ELECTRICALLY HEATED CUTTING EDGE

Robert F. Shaw, 2180 Sand Hill Rd., Suite 320, Menlo Park, Calif. 94025

Original No. 3,826,263, dated Jul. 30, 1974, Ser. No. 278,684, Aug. 7, 1972. Division of Ser. No. 656,730, Feb. 9, 1976, Pat. No. Re. 30,190, which is a division of Ser. No. 63,645, Aug. 13, 1970, abandoned, which is a continuation of Ser. No. 681,737, Nov. 9, 1967, abandoned. Application for reissue Nov. 17, 1977, Ser. No. 852,470

Int. Cl.³ A61B *17/38*; A61N *3/00*

U.S. Cl. 128—303.1 **22 Claims**



19. A method of cutting tissue with simultaneous hemostasis comprising the steps of:

contacting the tissue to be cut with a tissue-cutting edge of an elevated temperature; and

establishing the elevated temperature by conducting current along a plurality of independent current paths located along the tissue-cutting edge.

Re. 31,724

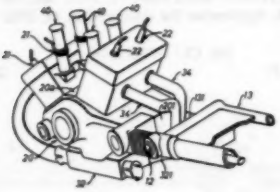
MOTORCYCLE EXHAUST SYSTEMS

Yoshiharu Isaka, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Original No. 4,327,811, dated May 4, 1982, Ser. No. 110,468, Jan. 8, 1980. Application for reissue Mar. 16, 1983, Ser. No. 475,835

Int. Cl.³ B62M 7/06; F01N 7/08

U.S. Cl. 180—219 14 Claims



1. In combination with a motorcycle of the type having a front frame portion mounting a front wheel and an engine, and a rear frame portion mounting a rear wheel, said portions being pivotally connected by a horizontally disposed pivot, said rear frame portion comprising a pair of laterally spaced-apart arms, said engine comprising two banks of cylinders, one disposed forwardly of the other, an exhaust system comprising:

a front bank exhaust pipe extending from said front bank, downwardly and to the side of the said frame and rearwardly;

a rear bank exhaust pipe extending rearwardly and downwardly between the planes of said arms and between the rear portion of said engine and the pivot of said arms;

a muffler having a substantial lateral extent mounted to said frame at an elevation beneath that of said engine, all of said exhaust pipes discharging into said muffler; and

a tailpipe discharging rearwardly from said muffler.

Re. 31,725

FUSED ALUMINUM OXIDE ABRASIVE GRAIN CONTAINING REDUCED TITANIUM OXIDE

Thomas B. Walker, Lewiston; Robert J. Seider, Ransomville, and Paul Cichy, Buffalo, all of N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Original No. 4,157,898, dated Jun. 12, 1979, Ser. No. 896,269, Apr. 14, 1978. Division of Ser. No. 691,817, Jun. 1, 1976, Pat. No. 4,111,668. Application for reissue Sep. 2, 1980, Ser. No. 183,495

Int. Cl.³ C09K 3/14; B24D 11/00

U.S. Cl. 51—309 12 Claims

1. A fused abrasive grain which is bluish black in color consisting essentially of:

(1) [titanium oxide containing] from about 0.42 to about 0.84% titanium, by weight of the abrasive grain, [said titanium being present as a reduced titanium oxide having an average oxidation state lower than in Ti_2O_3] *wherein said titanium is present in an easily recognizable second phase and in a form which has a low solubility in aluminum oxide;*

(2) from about 0.05 to about 0.3% by weight carbon;

(3) from about 0.02 to about 0.1% by weight Na_2O;

(4) from 0 to about 0.1% by weight total of calcium and silicon oxides; and

(5) alumina; said abrasive *grain* having a gain on ignition in air before roasting at 1300° C., when of a size of about 147 microns and finer, of from about 0.4 to about 0.7% by weight *and having improved abrasive properties wherein said fused abrasive grain has been roasted by subjecting the grain to an oxidizing atmosphere at a temperature of from about 1250° C. to about 1450° C. for from about 5 minutes to about 64 hours.*

Re. 31,726

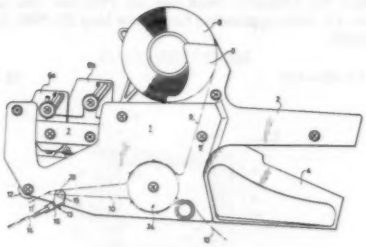
CORRECTION LABEL APPLYING DEVICE FOR A LABEL PRINTING MACHINE

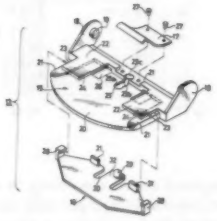
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

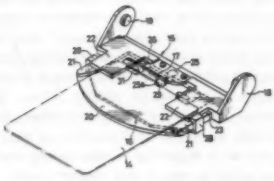
Original No. 4,259,138, dated Mar. 31, 1981, Ser. No. 32,378, Apr. 23, 1979. Application for reissue Aug. 20, 1981, Ser. No. 294,819

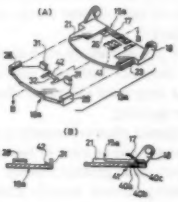
Int. Cl.³ B32B 31/04; B65H 9/16; B41K 3/04

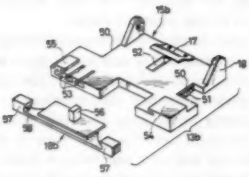
U.S. Cl. 156—363 13 Claims











20. A correction label applying device for applying a correction

label to a price tag, or the like, said device comprising:

a label applying element;

means for delivering a correction label to said label applying element;

a tag holder having a guide for receiving a price tag and a supporting surface for supporting said price tag, said tag holder being movable between a first position wherein said supporting surface is remote from said label applying element and a second position wherein said supporting surface is adjacent said label applying element such that a correction label located at said label applying element will be adhered to a price tag located in said tag holder when said tag holder is in said second position;

an adjusting member releasably attached to said tag holder, said adjusting member including at least one stopper extending into said guide for blocking further insertions of said price tag into said guide beyond said stopper;

cooperating means on said tag holder and said adjusting member for selectively positioning the location of said stopper in said guide; and

biasing means for normally biasing said tag holder into said first position such that said correction label can be freely delivered to said label applying element and such that said tag holder may be forcefully moved into said second position to cause said label applying element to apply said correction label to a desired location on said price tag.

Re. 31,727

VINYL GUM CURE ACCELERATORS FOR ADDITION-CURE SILICONE

Richard P. Eckberg, Round Lake, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Original No. 4,340,647, dated Jul. 20, 1982, Ser. No. 267,091, May 22, 1981. Application for reissue Oct. 14, 1982, Ser. No. 434,399

Int. Cl.[3] **B32B** *9/00*

U.S. Cl. 428—429 **28 Claims**

11. A method for rendering substrates relatively nonadherent to substances that would normally adhere thereto, comprising the steps of:

A. combining

(a) a diorganopolysiloxane base polymer having up to approximately 20% by weight alkenyl or silanol functional groups and having a viscosity ranging from approximately 50 to approximately 100,000 centipoise at 25° C.;

(b) a polymethylhydrogen siloxane fluid crosslinking agent having up to approximately 100% by weight SiH-containing siloxy groups and having a viscosity in the range of approximately 25 to approximately 1000 centipoise at 25° C.;

(c) an effective amount of precious metal catalyst for facilitating an addition cure hydrosilation reaction between said base polymer and said crosslinking agent at temperatures between, approximately, 90° to 300° C.; and

(d) an amount of dimethylvinyl chainstopped polydimethylmethylvinyl siloxane polymer gum effective for accelerating the cure of an addition curable composition wherein said gum has an average molecular weight of, approximately, 200,000 to 400,000 and a methylvinyl siloxy unit content of, approximately, 0 to 5.0 mole %.

18. A product made by the process of claim **11**.

Re. 31,728

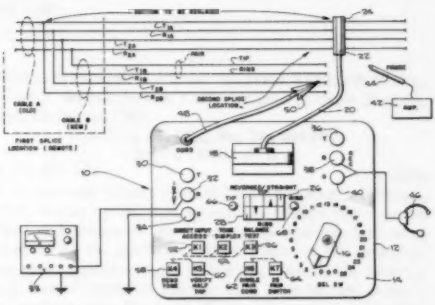
TEST SET

James F. Simmonds, Woodland Hills, Calif., assignor to Perkins Research & Manufacturing Co., Canoga Park, Calif.

Original No. 4,186,283, dated Jan. 29, 1980, Ser. No. 908,055, May 22, 1978. Application for reissue Jan. 28, 1982, Ser. No. 344,228

Int. Cl.[3] **H04M** *1/24*

U.S. Cl. 179—175.3 R **83 Claims**



50. In the splicing of telephone cables connected between a central office and remote equipment wherein a new tip/ring conductor pair is first half-tapped on one end into an old tip/ring conductor pair, the method of verifying the continuity of the new tip/ring pair on its other end prior to tapping the new and old pairs together on the other end comprising the steps of:

(a) electrically accessing the old tip and ring conductors and the new tip and ring conductors of the respective pairs at the other end; and,

(b) comparing the voltage potentials of the new tip/ring pair appearing at the other end to the voltage potentials of the old tip/ring pair and indicating the new tip/ring pair as probably a valid counterpart of the old tip/ring pair if the sums of the voltage potentials on the new and old tip/ring pairs are equal and reflect the central office potential.

51. The method of claim 50 wherein:

said step of comparing the voltage potentials of the new tip/ring pair to the voltage potentials of the old tip/ring pair comprises measuring the voltage potentials of the tip and ring conductors in each case by simultaneously connecting them to respective ones of a pair of linear voltage meters each having its zero point aligned with the point equal to the central office potential on the other meter whereby when the indicators of the meters are aligned, the sum of the two potentials is equal to the central office potential.

PLANT PATENTS

GRANTED NOVEMBER 6, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,318

ROSE PLANT JACNON 74-183

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 2, 1982, Ser. No. 404,045
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its orange-red, heavily substanced flowers borne on its vigorous, heavily branched plant.

5,319

ROSE PLANT

Glen Strahle, Carlton, Oreg., assignor to Carlton Rose Nurseries, Inc., Carlton, Oreg.

Filed Apr. 4, 1983, Ser. No. 481,713
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea Class obtained as a seedling from a seed parent of the Cara Mia variety and a pollen parent of the Volare variety characterized by its bright red color, its classic spiral bud and its ability to yield large long lasting blooms on a continuous basis in a greenhouse which maintain true color from bud through petal drop, substantially as shown and described.

5,320

ALMOND TREE

Clarence E. Aldrich, 10613 John Fox Rd., Hughson, Calif. 95326, assignor to Clarence E. Aldrich; Maryanne Aldrich, both of Hughson and Randal C. Aldrich, Waterford, all of, Calif.

Filed Feb. 28, 1983, Ser. No. 470,518
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, particularly characterized by heavy bloom before Mission but coincident with Nonpareil; and by the regular and heavy production of medium hard shell, well sealed nuts which hold well, knock easily, and have an extremely thin hull at green stage and a paper thin hull at harvest; the harvest being before Carmel and Mission, with Merced, and after Ne Plus.

5,321

BEGONIA PLANT NAMED NINON

Erland V. Schelbeck, Odense, Denmark, assignor to L. Dachnfeldt Ltd., Odense, Denmark

Filed Sep. 20, 1982, Ser. No. 420,522
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia named Ninon, as described and illustrated, and particularly characterized by its vigorous growth habit; large dark green foliage; large flowers which frequently are compound with several whorls of interior petals; distinct peach/pink flower color, and its excellent keeping qualities.

5,322

CHRYSANTHEMUM PLANT NAMED DARING

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 4, 1983, Ser. No. 463,921
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Daring, as described and illustrated, and particularly characterized as to uniqueness by the combined characteritics of flat capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum ranging from 90 to 105 mm. at maturity; uniform nine week flowering response; tall plant height when grown single stem; 20 to 25 cm. peduncles on open, normally terminal sprays; and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

5,323

CHRYSANTHEMUM PLANT NAMED YELLOW NOVA

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 16, 1982, Ser. No. 419,008
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., known by the cultivar name of Yellow Nova, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; yellow ray floret color; diameter across face of capitulum ranging from 75 to 95 mm. at maturity; uniform nine (9) week flowering response; tall plant height when grown as a single stem cut spray; 10 to 15 cm. peduncles on open, normally terminal sprays, and slow development of tight green discs, and tolerance of 13° C. (56° F.) for initiation and development when grown in single stem cut spray programs with a continuous dark period of 13 to 15 hours.

5,324

CHRYSANTHEMUM PLANT NAMED DEBONAIR

William E. Duffett, Salinas, Calif., and Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, assignors to Grace H. Mack, New Canaan, Conn.

Filed Oct. 21, 1982, Ser. No. 435,694
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the name Debonair, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, decorative capitulum type, durable inflorescence, purple ray floret color, diameter across face of capitulum up to 55 mm., short plant height, compact, spreading branching pattern, average natural season flowering date of Sept. 15, and average flowering response period of seven (7) weeks in photoperiodic controlled short day programs.

5,325

CHRYSANTHEMUM PLANT NAMED METEOR

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 4, 1983, Ser. No. 463,924
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum*

morifolium, Ramat., plant known by the cultivar name Meteor, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of semi-incurved capitulum form; decorative capitulum type; yellow ray floret color; diameter across face of capitulum ranging from 100 to 130 mm. at maturity; uniform nine week flowering response; tall plant height; semi-spreading branching pattern; and dual value as both pinched and standard disbud pot mums.

5,326

CHRYSANTHEMUM PLANT NAMED VIKING

Jack M. Meek, deceased, late of Salinas, Calif.; by Saundra J. Meek, executrix, Canyon, Tex.; William E. Duffett, Salinas, Calif., and Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, assignors to Grace H. Mack, New Canaan, Conn.

Filed Oct. 21, 1982, Ser. No. 435,692
Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., plant known by the name Viking, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, decorative capitulum type, bronze ray floret color, diameter across face of capitulum up to 75 mm., tall plant height, spreading branching pattern, average natural season flowering date of September 20, and average flowering response period of seven (7) weeks in photoperiodic short day programs.

5,327

CHRYSANTHEMUM PLANT NAMED TOTEM

Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840

Filed Oct. 21, 1982, Ser. No. 435,693
Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., plant known by the name Totem, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, decorative capitulum type, orange bronze ray floret color, diameter across face of capitulum up to 60 mm., medium plant height, spreading branching pattern, average natural season flowering date of Sept. 20, and average flowering response period of seven (7) weeks in photoperiodic controlled short day programs.

PATENTS

GRANTED NOV. 6, 1984

ERRATA

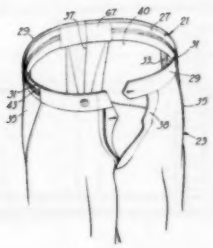
For CLASS	See PATENT NO.
446–188	4,480,400
446–456	4,480,401
128–001	4,480,596
534–700	4,481,141
548–264	4,481,356
502–040	4,481,368
373–093	4,481,500
346–076	4,481,518

PATENTS

GRANTED NOVEMBER 6, 1984

GENERAL AND MECHANICAL

4,480,339
VARIABLY EXTENSIBLE WAISTBAND STRUCTURE
John S. Hubbard, Sr., 826 Knollwood La., Bremen, Ga. 30110
Filed Nov. 26, 1982, Ser. No. 444,849
Int. Cl.³ A41F 9/02
U.S. Cl. 2—237 **11 Claims**



1. A garment waistband structure comprising:

(a) an elastic band comprising a left section and a right section;

(b) a four-segment fabric web partially covering the elastic band such that an area of the outside surface of the elastic band near each side seam of the garment remains exposed, comprising, for each section of the elastic band:

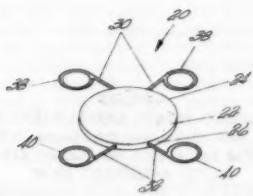
(i) a rear segment extending from the outlet near the seat seam of the garment to the exposed area of the elastic band; and

(ii) a front segment extending from the exposed area of the elastic band to the fly of the garment;

(c) a first securing means which attaches the upper linear edge of each fabric web segment to the upper inside surface of the elastic band; and

(d) a second securing means which attaches the lower linear edge of each fabric web segment to the outside surface of the elastic band.

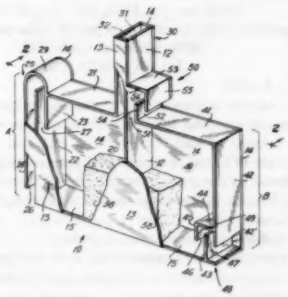
4,480,340
INTRAOCULAR LENS WITH RESILIENT SUPPORT MEANS
Dennis D. Shepard, 401 E. Palisade, Santa Maria, Calif. 93454
Filed Feb. 18, 1981, Ser. No. 235,585
Int. Cl.³ A61F 1/16, 1/24
U.S. Cl. 3—13 **10 Claims**



10. An intraocular lens adapted to be located in either the anterior chamber or posterior chamber of an eye wherein the lens body has a first sector end and a second sector end and the lens body is adapted to be positioned over the pupil of an eye in a proper optical relationship, said lens body having resilient support members extending outwardly in the plane of the lens from the periphery of the first sector end and the second sector end, said intraocular lens being characterized in that:

at least two of said resilient support members are located in at least one of the first sector end and second sector end wherein each of said resilient support members is in the form of an elongated deflectable strand having one end thereof which terminates in an annular shaped guide and support member having an enlarged extended surface defining a curved path which includes a portion extending towards the lens body and the other end of which is adapted to be secured in a predetermined position in at least one of said first sector end and said second sector end on the periphery of the lens body, said at least two resilient support members each having the other end thereof secured within the same sector end in said lens body and positioned at a selected diverging angle relative to each of said other ends and with each of said one ends, which terminate in said annular shaped guide and support members enlarged extended surface defining a curved path, being positioned with the portion thereof extending towards the lens body being substantially coplanar with the lens body and with each of the curved paths being located in an opposed direction away from the other of said two resilient support members located on the same sector end, said enlarged extended surface defining the curved path being adapted to slidably engage tissue in at least one of an anterior chamber and posterior chamber of an eye applying a circumferential force onto and deflecting said resilient support members within the plane of the lens body which is adapted to position and center the lens body and to control movement thereof relative to and around the center of the pupil and to provide self-adjusting and maintaining of the lens body relative to the pupil in a proper optical relationship independent of movements of the eye.

4,480,341
PASSIVE DISPENSER
Randall G. Richards, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 346,975, Feb. 8, 1982,. This application Oct. 27, 1982, Ser. No. 436,902
The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.
Int. Cl.³ E03D 9/02
U.S. Cl. 4—228 **17 Claims**



1. A passive dispenser for containing a quantity of a first solution and a second solution and for codispensing a predetermined volume of said first solution and said second solution into a body of liquid in which the passive dispenser is placed in response to the level of said body of liquid being lowered from a first elevation to a second elevation, the passive dispenser comprising:

a first chamber, said chamber containing a first water-soluble cake forming, upon dissolution, the first solution;

a vent conduit extending from said first product chamber, the top of said vent conduit extending above the first elevation of the body of liquid;

an inlet/outlet pathway, said pathway connecting the first product chamber with the body of liquid and comprising a first conduit exterior the chamber, and a second conduit interior the chamber, said second conduit extending a predetermined distance into the chamber below the top thereof, the bottom of the second conduit being at a greater height than the bottom of the first conduit, said conduit being in fluid communication at their upper ends;

a second product chamber, said chamber containing a second water-soluble cake forming, upon dissolution, the second solution;

venting means extending from the second chamber, said means adopted to isolate the second solution from the body of liquid during quiescent periods, and a refill/discharge pathway disposed below said vending means, said pathway connecting the second product chamber with the body of liquid and comprising two conduits in fluid communication with each other, one conduit being adjacent to said second product chamber to form an air trap conduit, the other conduit being adjacent to said body of liquid to form an air refill conduit, a transfer port connecting said conduits, the air trap chamber being in fluid communicaiton with the second product chamber at a level no higher than the level at which the air refill chamber is in fluid communication with the body of liquid and the cross-sectional area of said transfer port normal to fluid flow being smaller than the cross-sectional area of said air trap conduit normal to fluid flow such that air in said pathway is not completely displaced by said liquid when the level of said body of liquid rises from the second elevation to the first elevation, thereby forming an air lock in said pathway during quiescent periods,

whereby, when the body of liquid is lowered from the first elevation to the second elevation, solution in the first product chamber above the bottom end of the interior conduit of the inlet/outlet pathway is dispensed by siphon flow and solution in the second product chamber above the transfer port of the refill/discharge pathway is dispensed by gravity.

4,480,342

PASSIVE DISPENSER

Gregory R. Jones, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Filed Jan. 14, 1983, Ser. No. 457,995

The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

Int. Cl.³ E03D *9/02*

U.S. Cl. 4—228 **17 Claims**

1. A passive dispenser for containing a quantity of a first solution and a second solution and for codispensing a predetermined volume of said first solution and said second solution into a body of liquid in which said passive dispenser is placed, in response to the level of said body of liquid being lowered from a first elevation to a second elevation, the passive dispenser comprising.

a first dispensing section comprising:

a first product chamber, said first chamber containing a water-soluble cake forming, upon dissolution, the first solution;

a vent conduit extending upwardly from the top of the first chamber;

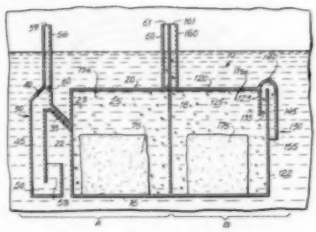
a refill/discharge pathway having an exit/inlet port at the lower end and an inclined conduit at the upper end, the lower end of the inclined conduit entering said first product chamber at a predetermined distance below the top thereof, and

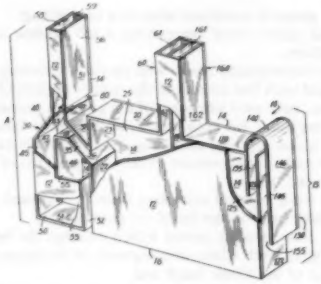
a conduit to vent said refill/discharge pathway, said conduit extending upwardly from the top of the refill/discharge pathway, and

a second dispensing section in separate relationship from the first, said second dispensing section comprising:

a second product chamber, said second chamber containing a water-soluble cake forming, upon dissolution, the second solution;

a vent conduit extending upwardly from the top of the second chamber, and





an inlet/outlet pathway providing fluid communication between said second chamber and the body of liquid, said pathway entering the chamber at a predetermined distance below the top thereof,

whereby, when the body of liquid is lowered from the first elevation to the second elevation, a predetermined volume of solution in the first chamber and a predetermined volume of solution in the second chamber is dispensed.

4,480,343

COMBINATION DRAIN AND CUTTING BOARD

Edward Drach, 4390 Richardson Ave., Bronx, N.Y. 10466

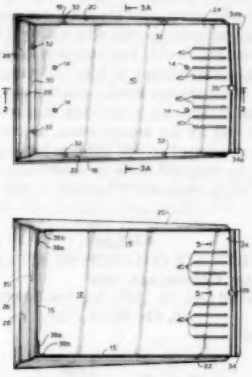
Filed Apr. 4, 1983, Ser. No. 481,915

Int. Cl.³ A47L *19/02, 19/04*

U.S. Cl. 4—656 **17 Claims**

1. A combination drain and cutting board for use with a dish rack having a laterally extending member or the like comprising a substantially planar member having first and second opposing surfaces adapted to be used alternately in first and second orientations to provide drain and cutting surface functions, respectively, said first surface being adapted to receive a dish rack thereon when said member is in said first orientation, means for supporting said member with said first surface at an incline, means, mounted on and extending from said first surface, for engaging the laterally extending member of the dish

rack such that movement of the dish rack relative to the first surface is substantially prevented, said second surface having a



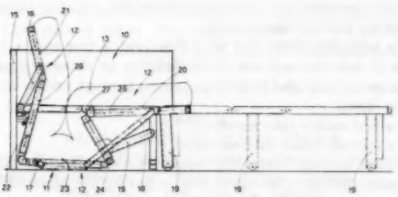
substantially unobstructed portion adapted to function as a cutting surface when said member is in said second orientation.

4,480,344

DIVAN-BED

Alfio Padovan, Via Nuove Fratte, 61, 33082 Azzano Decimo (PN), Italy

Filed Mar. 23, 1983, Ser. No. 478,028
Claims priority, application Italy, Apr. 9, 1982, 60365/82[U]
Int. Cl.³ A47C *17/04*
U.S. Cl. 5—48 **8 Claims**



1. A divan-bed comprising a frame cooperating with side walls and with a crosswise element which connects said side walls, said frame including five consecutive, articulated leaves covered with a one-piece mattress, the two end leaves being placed next to each other to form, in the divan position, the seat and seat back of the divan, the intermediate leaves together with the related portions of the mattress being folded and stored in crooked succession within a hidden zone in the base of the divan underneath the zone where said end leaves are placed next to each other, all of said leaves and related portions of the mattress being extendable to form the bed.

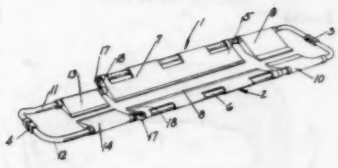
4,480,345

BREAK-AWAY SCOOP STRETCHER

Robert E. Dunn, Washington Court House, Ohio, assignor to Ferno-Washington, Inc., Wilmington, Ohio

Filed Jul. 6, 1982, Ser. No. 395,722
Int. Cl.³ A61G *1/00*
U.S. Cl. 5—82 R **7 Claims**

1. In a break-away stretcher having a pair of complimentary frame parts detachably interconnected at each end by pivot means so that the complimentary parts may be detached, fitted beneath a patient from opposite sides and reattached with the patient supported on the stretcher, said frame parts including a body section and an extensible section having cylindrical tubular frame members telescopically received in the body section so that the length of the stretcher may be adjusted, each of said sections including aligned pairs of scoop-like patient supporting panels, the patient supporting panels of said extensible section being secured to said cylindrical tubular frame members, and locking means for maintaining said extensible section in a selected position of use relative to said body section in accordance with the size of the patient being carried, the improvement comprising polygonal tubes in said body section positioned to telescopically receive the cylindrical tubular frame members of said extensible section, and polygonal plugs



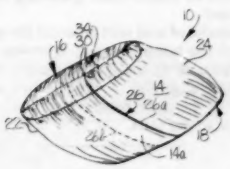
non-rotatably affixed to the ends of the cylindrical tubular frame members inserted in said polygonal tubes, said plugs being of a size to be slidably but non-rotatably received in said polygonal tubes, whereby rotation of the tubular frame members of the extensible section relative to said body section is prevented when said locking means are disengaged and at least one end of the pair of complimentary frame parts is separated, and the patient supporting panels of the extensible section will be maintained at all times in proper alignment with the patient receiving panels of said body section irrespective of relative movement between the extensible section and the body section.

4,480,346

PILLOW SHAM

Jeanette C. Hawkins, Stoneville; Nancy W. Sella, Mebane, and Carl D. Bradford, Eden, all of N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Sep. 29, 1982, Ser. No. 428,031
Int. Cl.³ A47G *9/00*
U.S. Cl. 5—490 **2 Claims**



1. A pillow sham comprising an envelope of sheet material and including front and rear panels, opposed closed sides, opposite ends, and a pillow-receiving opening in the rear panel, said sham being formed from a single rectangular sheet of material with the length of the sheet of material being several times the width of the sheet, said sheet of material being folded upon itself in an overlapped fashion to present a pair of opposing faces, a pair of fold lines, an overlap and confronted side edges of the sheet, the opposing faces defining said front and rear panels, the fold lines defining said opposed ends and the overlap defining the pillow-receiving opening in the rear panel, seams joining together the confronted side edges of the sheet to define said opposed closed sides, elastic means incorporated into said seams for effecting a gathering of the sheet material adjacent thereto and presenting an overall gathered appearance to the sham, and a lengthwise-extending strip of

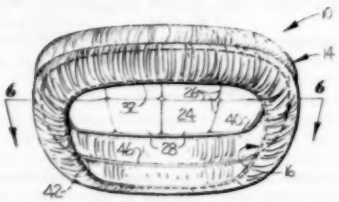
elastic material secured to the sheet material on each side of each seam, the strips of elastic material being positioned and secured to the sheet material to effect a further enhanced gathered appearance for the sham.

4,480,347

PILLOW SHAM

Jeanette C. Hawkins, Stoneville; Nancy W. Seila, Mebane, and Carl D. Bradford, Eden, all of N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Sep. 29, 1982, Ser. No. 428,159
Int. Cl.³ A47G 9/00
U.S. Cl. 5—490 **1 Claim**



1. A pillow sham comprising;
a front panel having facing and backing layers of fabric and batting therebetween, and stitching interconnecting said facing and backing layers of fabric so as to present a quilted appearance to the front panel;
an endless skirt connected to said front panel along the entire perimeter of the panel and cooperating therewith to define a pocket on one side of said panel adapted to removably receive a pillow therein;
said skirt being formed from sheet material and having a free edge defining an opening behind said front panel for access to the pocket;
elastic strip means secured to said skirt sheet material along the free edge thereof so as to effect a gathering of the skirt sheet material therealong;
second elastic strip means secured to the skirt sheet material intermediate the skirt free edge and front panel and extending therearound, said second elastic strip means serving to effect an intermediate gathering of the skirt sheet material; and
the sheet material of said skirt adjacent the perimeter of said front panel also being gathered, whereby the gathering of sheet material along the skirt free edge, and intermediate the skirt free edge and the front panel, and adjacent the perimeter of the front panel present an overall gathered appearance to the skirt.

4,480,348

TENSION-BAND BRIDGE

Ulrich Finsterwalder, Pagodenburgstrasse 8, 8000 Munchen, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,729
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211790
Int. Cl.³ E01D 11/00
U.S. Cl. 14—18 **6 Claims**

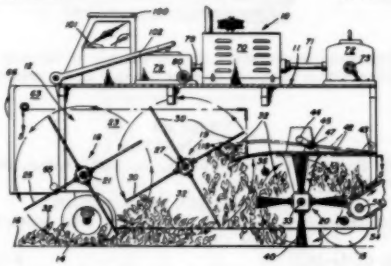
1. A tension-band bridge having a main opening, the traffic route of which is supported on a reinforced concrete tension-band extending on a catenary line across the main opening between abutments in which the reinforcements are anchored, the tension-band is provided with a carriageway saddling forming the traffic route over the main opening, the saddling being a latticework construction which is rigid transversely of the tension-band but flexible longitudinally of the tension-band thereby to allow the saddling to follow the movements of the catenary line of the tension-band, the latticework construction of the saddling comprising latticework frames which are supported above and by the tension-band, adjacent latticework frames being connected to one another longitudinally of the tension-band, by diagonal struts in which shock absorbers are integrated to damp undesired vibrations in the tension band.

4,480,349

PARTICULATE COLLECTING APPARATUS

Thomas A. Barr, Chattanooga, Tenn.

Filed Oct. 24, 1983, Ser. No. 544,797
Int. Cl.³ E01H 1/04
U.S. Cl. 15—4 **10 Claims**



1. An apparatus for collecting particulate material from a depository surface, comprising:
(a) a vehicular frame having a front end, a rear end, a top wall and opposed side walls defining an elongated passageway extended from front-to-rear through said vehicular frame,
(b) a first rotary rake member,
(c) a second rotary rake member,
(d) each of said rotary rake members comprising an elongated shaft and a plurality of tines, having free extremities, extending radially of said corresponding shaft and spaced longitudinally and circumferentially of said corresponding elongated shaft,
(e) first mounted means supporting the shaft of said first rotary rake member in said passageway about a first transverse axis, so that said free extremities clear the depository surface over which said vehicular frame moves during rotation of said tines,
(f) second mounting means supporting the shaft of said second rotary rake member in said passageway for rotary movement about a second transverse axis spaced behind said first transverse axis, so that the tines of said second rotary rake member interdigitate with the tines of said first rotary rake member during rotation of said rotary rake members,
(g) means for driving the shafts of both rotary rake members in the same rotary direction so that the tines moving beneath the respective shafts are moving rearwardly through said passageway,
(h) a rotary brush member,
(i) means mounting said rotary brush member within said passageway behind said second rotary rake member for rotation about a transverse axis spaced behind the transverse rotary axis of said second rotary rake member a distance sufficient to permit the periphery of said brush member to pass closely adjacent the rotary path of the free

extremities of the tines of said second rotary brush member,

(j) means for driving said rotary brush member in a rotary direction opposite to the rotary directions of said first and second rotary rake members,

(k) depository means for receiving particulate material from said rotary brush member, and

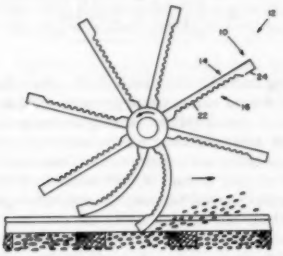
(l) motive means for moving said vehicular frame longitudinally forward over a depository surface.

4,480,350

SWEEPER BRISTLE

Larry F. White, 3004 S. Eaton, Denver, Colo. 80227

Filed Apr. 7, 1983, Ser. No. 483,038
Int. Cl.³ A46B *13/02, 7/10*
U.S. Cl. 15—159 A **22 Claims**



1. In a bristle of the type for railway roadbed brooms and having a polymeric body with an uncorrugated leading edge portion, a trailing edge portion, ends, and a longitudinal axis, the improvement comprising:

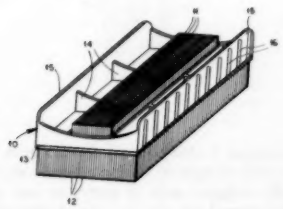
a body having a plurality of spaced apart grooves solely in at least part of the trailing edge portion that are oriented substantially transversely in relation to the longitudinal axis.

4,480,351

TWO-COMPONENT SCRUB BRUSH

Thomas Koffler, Willowdale, Canada, assignor to Innovative Molding Technology Inc. (Imtech), Bolton, Canada

Filed Dec. 1, 1982, Ser. No. 445,936
Int. Cl.³ A46B *3/04, 9/02*
U.S. Cl. 15—187 **12 Claims**



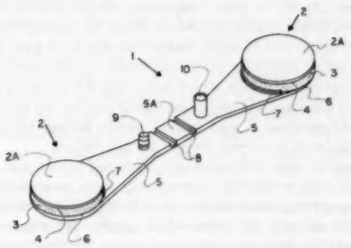
1. A scrub brush comprising a body, a first set of bristles of a relatively hard polymeric material on said body, and a second set of bristles of a relatively soft elastomeric material on said body, said relatively soft material being a block copolymer of the form A-B-A, A being a polymerized mono-alpha-alkenyl arene, B being a polymerized conjucated diene, said relatively hard material being a lower polyolefin, said relatively soft and relatively hard material having moduli of elasticity differing by a ratio of at least 1:100 at room temperature.

4,480,352

APPARATUS FOR CLEANING LENSES, MIRRORS AND THE LIKE

John G. Eggett, Surrey, Canada, assignor to Trend Setter Products, Inc., Surrey, Canada

Filed Mar. 7, 1983, Ser. No. 472,938
Int. Cl.³ G02C *13/00*
U.S. Cl. 15—214 **7 Claims**



1. An apparatus for cleaning lenses, mirrors and the like, comprising:

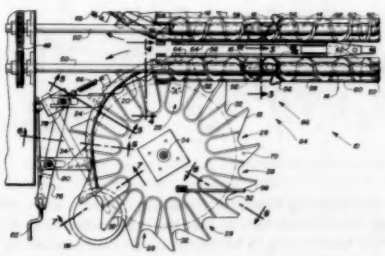
a single piece of plastic material having a pair of parallel, transverse grooves which demarcate a pair of jaws and a connecting element there between, said single piece of plastic material being essentially flat and foldable along said grooves such that said jaws are placeable in a closed, opposed position to form a pincer; and a pair of cleaning pads, each of said cleaning pads being affixed to one of said jaws near the free end thereof for simultaneous cleaning of two parallel surfaces of a lens or a mirror or the like when said jaws are placed in a closed, opposed position to form a pincer.

4,480,353

LEG SPLITTING MACHINE

Eugene G. Martin, New Holland; Harold C. Martin, Lancaster, and Dale M. Risser, Denver, all of Pa., assignors to FoodCraft Equipment Co., Inc., Lancaster, Pa.

Filed Mar. 28, 1983, Ser. No. 479,351
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—11 **7 Claims**



1. A leg splitting machine adapted to receivably infeed thereto a succession of separated whole poultry legs and thereafter automatically process the same to deliver therefrom as reduced pieces a thigh cut and a drumstick cut, said leg splitting machine comprising in combination:

a. a support frame structure having interconnected vertical and horizontal members,

b. at least one rotating flited helical conveyor infeed shaft with a spaced set of elongated infeed guide retaining rails in turn adjustably positioned in depending underlying spaced relationship relative to said rotating flited helical

conveyor infeed shaft wherein the respective axes of said shaft and said rails are parallel one to the other,

c. at least one rotating slotted pocket wheel having an upper wheel sheave and a lower wheel sheave with a uniform spaced slot therebetween and provided with a plurality of pocket means radially spaced at regularly repeating arcuate displacements circumferentially about the edge of said wheel said pocket means adapted to receivably support respectively therein a separated whole poultry leg in a bent configuration described about the natural flex arc of the drumstick-to-thigh ball-and-socket knee joint thereof,

d. a set of fold-over guide rail means in adjustable spaced relationship to said wheel and adapted to slidably receive and maintain said separated whole poultry leg in said bent configuration in said pocket means during arcuate displacement transport thereof by said wheel,

an angled slot blade adjustably disposed within said spaced slot and positioned to separably sever sequentially and respectively each drumstick-to-thigh ball-and-socket knee joint of each separated whole poultry leg maintained in said bent configuration during arcuate displacement transport thereof by said wheel into engagement with said angled slot blade, and

f. a power to impart mechanically cooperative timed rotational motion to said rotating flited helical conveyor infeed shaft and said rotating slotted pocket wheel.

4,480,354

ROVING HOLDING MECHANISM FOR DRAW FRAMES

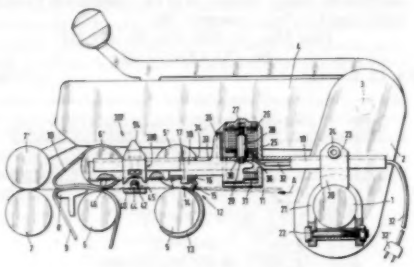
Alfred Glock, Stuttgart; Kurt Seebo, Esslingen; Bernhard Schoenung, Filderstadt, and Dieter Tkotz, Tamm, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 494,639

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3218660

Int. Cl.³ D01G *31/00*

U.S. Cl. 19—0.25 **7 Claims**



1. In a drawing frame for a spinning machine converting a roving into a thread having inlet and outlet roller pairs aligned to draw said roving, a blocking mechanism responsive to a break in the thread exiting from said outlet rollers to clamp said roving at said inlet rollers and a roving holder and alignment appparatus located between said inlet and outlet rollers comprising a table mounted cantilevered below said roving and a shaped arm mounted above said roving, said arm being rotatable synchronously with said blocking mechanism into a first position to hold the end of the said roving to said table, and into a second position to permit said roving to pass freely therebetween, and a cover above said arm, said cover being inclined and cooperating with said table to cause the roving when placed thereon to automatically slide thereover into position between said table and said arm.

4,480,355

DRAWING FRAME

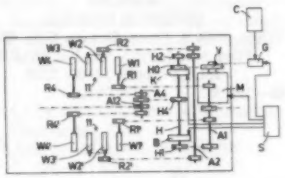
Louis Vignon, Geneva, and Alf Schopper, Meyrin, both of Switzerland, assignors to Heberlein Hispano SA, Vernier-Geneva, Switzerland

Filed Aug. 18, 1982, Ser. No. 409,289

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1981, 3133436; Aug. 24, 1981, 3133437

Int. Cl.³ D01H *5/32*

U.S. Cl. 19—236 **5 Claims**



1. A drawing frame having a main shaft, a draw head having a plurality of driven rollers drivingly connected to the main shaft, an electric motor (M) for driving the main shaft via an adjustable belt gear, including a stagelessly adjustable transmission ratio, a brake, cut-off means for automatically switching-off of the electric motor (M) and actuating a brake and a releasable clutch disposed between the adjustable gear and the main shaft, which can be actuated by the cut-off means when the electric motor is switched off and the brake is actuated, the brake being arranged to act on the main shaft and the cut-off means being connected with an adjusting member of the adjustable gear such that it resets the adjustable gear to its maximum or start transmission ratio in preparation for the restart of the draw frame after the brake has been actuated and the clutch released, as long as the switched-off electric motor is still running on as a result of its inertia.

4,480,356

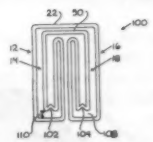
DOUBLE-GRIP CLIP

Donald A. Martin, 1411 Dugdale, North Chicago, Ill. 60064

Continuation-in-part of Ser. No. 309,457, Oct. 7, 1981,. This application Oct. 11, 1983, Ser. No. 540,635

Int. Cl.³ B42F *1/02*; A44B *21/00*

U.S. Cl. 24—67.9 **20 Claims**



1. A continuous double-grip clip formed from a single and continuous piece of material having no ends and bent to form a first of pair gripping units to appear on one side of items desired to be gripped and a second pair of gripping units on an opposing side of said items, wherein:

a. said double-grip clip includes a first outer grip, a first inner grip substantially coplanar therewith and interior to said first outer grip, a second outer grip and second inner grip substantially coplanar therewith and interior to said second outer grip;

b. said first outer grip and said second inner grip are substantially coplanar;

c. said first outer grip is substantially a mirror image of said second outer grip;

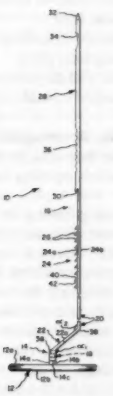
d. said first inner grip is substantially a mirror image of said second inner grip;
e. said first outer grip and said second outer grip are joined by a substantially straight top;
f. a first outer device side is substantially perpendicular to said straight top at a first end of said top;
g. a first outer base is continuous from said first outer device side, is oppositely disposed from said straight top and is substantially parallel to said straight top;
h. a first interior arm is continuous from and substantially perpendicular to said first outer base, and is oppositely disposed from first outer device side;
i. said first inner grip includes a first inner leg connected to a first interior arm at a first inner arc;
j. said first inner leg is substantially parallel and adjacent to said first interior arm;
k. a first inner base is substantially perpendicular to said first inner leg and oppositely disposed from said first inner arc;
l. a first inner side is substantially perpendicular to said first inner base and oppositely disposed from said first inner leg;
m. a first inner top connects a second inner grip with said first inner grip;
n. a second outer device side extends from and is substantially perpendicular to said straight top;
o. a second outer base is perpendicular and oppositely disposed from said straight top as a continuing part of said second outer device side;
p. a second interior arm is oppositely disposed from said second outer device side and perpendicular to said second outer base;
q. a second inner arc is a continuation of said second interior arm and oppositely disposed from second outer base;
r. said second inner arc continues to form a second inner leg;
s. said second inner leg is between said second outer device side and said second interior arm; and
t. a second inner base is substantially perpendicular to said second inner leg and oppositely disposed from said second inner arc.

4,480,357

BUTTON SECURING DEVICE

Richard D. Cummins, 6092 Emerson Dr., Orchard Park, N.Y. 14127

Filed Jul. 8, 1982, Ser. No. 396,154
Int. Cl.³ A44B *1/18*
U.S. Cl. 24—90 R **9 Claims**



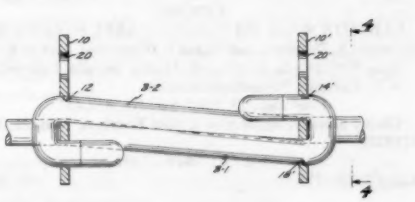
1. A button securing device for attaching a button having at least one pair of holes to a piece of fabric, said securing device comprising:
a base portion;
a standoff post for maintaining said button in a spaced relationship relative to said base portion, said standoff post being joined to said base portion and having a locking slot extending therethrough; and
a filament portion including a transition section having opposite ends thereof joined by hinge areas to said standoff post and an adjacent portion of said filament portion, said filament portion having a length sufficient to permit same in sequence to be passed in a single direction through said fabric to create an opening in said fabric and to pull said standoff post through said opening to position said fabric against said base portion, to be threaded through said pair of holes and to be passed through said locking slot sufficiently to draw said button for engagement with said transition section and to position said button in proximity to said standoff post adjacent the juncture thereof with said transition section wherein said button in disposed essentially parallel to said base portion, said transition section has a length as measured between said hinge areas corresponding to about one-half of the distance between holes of said pair of holes whereby to permit said button to be approximately centered relative to said standoff post, and said hinge areas are defined by providing said transition section with an as-formed configuration, wherein it is arranged at angles other than 180° with respect to said standoff post and said adjacent portion of said filament portion and said filament portion and said standoff post cooperate to define locking means tending to prevent retrograde movement of said filament portion from within said locking slot after being passed therethrough, and said base portion, said standoff post and said filament portion are integrally mold formed from resiliently deformable material.

4,480,358

TIE STRUCTURE

Donald E. Barling, 635 #3 N. Chipewa Ave., Anaheim, Calif. 92801, and John W. Barling, Westlawn, Hisperia Mobile Estates, Hisperia, Calif. 92345

Filed Dec. 2, 1982, Ser. No. 446,587
Int. Cl.³ F16G *11/00*; **B65D** *63/00*
U.S. Cl. 24—115 G **4 Claims**



1. In combination with a pliable elongate member, a tie that may be removably secured to an end portion of said elongate member, said tie being a rigid sheet of material having a centered first opening and a plurality of circumferentially spaced second openings therein, said first and second openings of slightly greater diameter than said elongate member, said sheet having forward and rear side surfaces, and said tie removably secured to said elongate member when said end portion is advanced forwardly through said first opening and then rearwardly through one of said second openings, with said tie being removably anchored to said elongate member to resist separation therefrom when said elongate member is tensioned to a direction rearwardly of said tie, with there being a sufficient number of said second openings that said end portion may be extended therethrough to define at least one loop adjacent said forward surface, and said loop being compressed by said end portion when said elongate member is tensioned in a direction to force said end portion into contact with said loop, with

at least said first opening and two of said second openings being axially aligned.

4,480,359

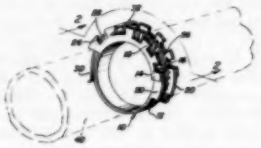
OVERCENTER LOCKING HOSE CLAMP

Raymond E. Koster, R.R. #1, Dorchester, Iowa 52140

Filed Dec. 29, 1982, Ser. No. 454,322

Int. Cl.³ B65D *63/00*; F16L *33/12*

U.S. Cl. 24—270 **10 Claims**



1. An elongated arcuate strip member having overlapped opposite ends and constructed of non-elastic rigid material having minimal flexive properties, one of said ends including anchor means supported therefrom, the other of said ends including an arcuate lever having one end pivotally supported from said other strip member end for swinging into and out of position closely overlying and paralleling said other end and with said other end of said lever extending in the direction along said strip member in which the latter extends from said other end to said one end of said strip member, an elongated stiff expansion spring having one end anchored relative to said anchor means and the other end anchored relative to said lever intermediate said one and other ends thereof, said one end of said strip member overlapping the outer surface of said other end of said strip member, said opposite ends of said strip member defining channel member portions extending longitudinally of said strip member, said channel member portions opening outwardly of said arcuate strip member, the channel member portion carried by said one end of said strip member being snugly slidably telescoped within the channel member portion defined by said other end of said strip member.

4,480,360

CLIP FOR WALL OR CEILING PANEL STRUCTURE

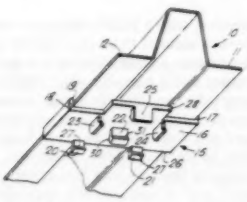
Johannes A. Brugman, and Petrus J. Hennequin, both of Rotterdam, Netherlands, assignors to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Dec. 23, 1982, Ser. No. 452,437

Claims priority, application United Kingdom, May 25, 1982, 8215220

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—295 **10 Claims**



1. A multipurpose panel structure clip for selectively mounting adjacent panels close together or in a spaced position to a carrier and where the panels have inturned rims on their longitudinal edges, said clip comprising a body adapted to be attached to a carrier and at least four laterally spaced downwardly extending retaining means on said body with the first and fourth of said retaining means each having a retaining lug extending laterally inwardly therefrom, with the second retaining means being laterally spaced from the first retaining means by an amount to allow two adjacent panels to be inserted in abutting relation between the first and second retaining means, with the second retaining means having a lateral retaining lug directed towards the first retaining means and a further lateral retaining lug directed towards the third retaining means and being spaced therefrom by an amount to accommodate the rim of only one panel, and with the third retaining means being spaced from the fourth retaining means by an amount to accommodate only one panel.

4,480,361

CLASP UTILIZING ATTRACTIVE FORCE OF PERMANENT MAGNET

Tamao Morita, 47-1, 6-chome, Arakawa, Arakawa-ku, Tokyo, Japan (116)

Filed Dec. 2, 1982, Ser. No. 446,211

Claims priority, application Japan, Dec. 16, 1981, 56-204443

Int. Cl.³ H01F *3/12*

U.S. Cl. 24—303 **3 Claims**

1. A magnetic fastener comprising:

(a) a first fastening element, including

a permanent magnet having oppositely facing pole faces of opposite polarity and at least one peripheral edge, said magnet having a hole extending between the first pole face and the second pole face;

a first ferromagnetic plate in contact on one face thereof with said first pole face;

a first fastening means extending from the other face of said first ferromagnetic plate;

a first ferromagnetic rod disposed within and coaxial with said hole and secured to said one face of said first ferromagnetic plate;

a magnetic shielding ferromagnetic plate in contact with said second pole face and having an opening passing therethrough, which opening is coaxial with said hole; and

a nonmagnetic housing having an edge portion surrounding the at least one peripheral edge of said permanent magnet, inwardly directed extensions on said edge portion for securing said first ferromagnetic plate and said magnetic shielding ferromagnetic plate to said permanent magnet, said extension on the edge portion of said housing adjacent said magnetic shielding ferromagnetic plate extending over said shielding plate and having a protruding rim at its periphery where it joins said edge portion to form a dish-shaped upper surface, and an aperture coaxial with said hole in said upper surface; and

(b) a second fastening element detachably engageable with said first fastening element, including

a second ferromagnetic plate having a peripheral size smaller than said rim;

a second fastening means secured to said second ferromagnetic plate; and

a second ferromagnetic rod secured to said second ferromagnetic plate, so that when the first and second fastening elements are engaged, said first ferromagnetic rod projects into said hole and contacts said second ferromagnetic rod and said second ferromagnetic plate contacts said dish-shaped upper surface of said housing within said rim.

4,480,362

PROCESS AND MACHINE FOR FABRIC TREATMENT

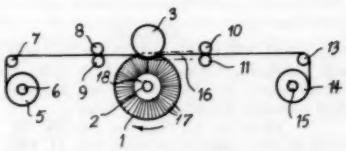
Gordon W. Maxwell, Kilburn, England, assignor to Courtaulds Limited, London, England

Continuation of Ser. No. 152,632, May 23, 1980, abandoned. This application Jan. 6, 1982, Ser. No. 337,395

Claims priority, application United Kingdom, May 24, 1979, 7918172

Int. Cl.³ D06C *11/00*

U.S. Cl. 26—28 **6 Claims**



1. A fabric abrading machine for raising a pile predominantly by pure abrasion on the surface of a fabric, said machine including:

(a) an abrading roller consisting essentially of a solid, wholly coherent body of a yieldable non-woven, three dimension, skeletal network incorporating abrasive particles distributed throughout said body;

(b) a rigid pressure element arranged in nip relationship with said abrading roller;

(c) means mounting said abrading roller and said pressure element whereby said pressure element is able to press into and cause a depression in said abrading roller body having a depth at least in the region of from 1 to 6 mm;

(d) means for forwarding fabric along a path through said nip between the abrading roller and said pressure element and in contact with the surface of said abrading roller body; and

(e) means for rotating said abrading roller body at a speed such that the surface speed of the abrading roller is substantially greater than the forwarding speed of the fabric.

5. A method of abrading a fabric surface predominantly by pure abrasion to produce a pile thereon, said method comprising the steps of:

(a) forwarding a fabric along a path which brings a surface thereof in contact with the surface of an abrasive roller consisting essentially of a yieldable solid, coherent body of a non-woven three dimensional skeletal network incorporating abrasive particles distributed through said network,

(b) exerting pressure on the fabric by means of a rigid pressure element in nip relationship with said abrading roller so that said rigid pressure element causes a depression in said abrading roller body having a depth at least in the region of from 1 to 6 mm and presses the fabric against the abrading roller body in said depression, and

(c) rotating said abrading roller at a speed such that the surface speed of the abrading roller is substantially greater than the speed of the fabric.

4,480,363

NAPPING APPARATUS FOR TEXTILE MATERIAL

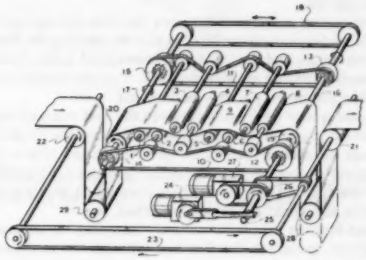
Dionisio T. Segura, Joaquin Blume num. 4, Sabadell (Barcelona), Spain

Filed Nov. 27, 1979, Ser. No. 97,872

Claims priority, application Spain, Nov. 27, 1978, 475.450

Int. Cl.³ D06C *11/00*

U.S. Cl. 26—29 R **6 Claims**



1. Napping device for textile material, comprising a bedframe; a set of pairs of turnable spiked napping cylinders, said napping cylinders being so arranged with respect to the textile material that the orientation of the spikes of both cylinders in each pair is opposite to each other; means for drawing textile material longitudinally past the napping cylinders to impart a constant unidirectional motion to the textile material, and means for imparting to the textile material a reciprocal longitudinal movement, so that a portion of the textile material which passes through the napping cylinders moves alternatively in two opposite directions and in such a way that at the delivery of the device, the napping process is completely finished; and means for coordinating the movement of the napping cylinders with the movement of the textile material so that at every instant and for any of the textile material, each of the napping cylinders turns in the same direction as that of the textile material relative to the bedframe and in such a way that at any given moment the napping cylinders which have their spikes oriented in the same direction as the movement of the textile material as seen from a point adjacent to the textile material, have a tangential speed higher than the speed of the textile material and the napping cylinders, the spikes of which are oriented in the direction opposite to the movement of the textile material have a tangential speed lower than the speed of the textile material.

4,480,364

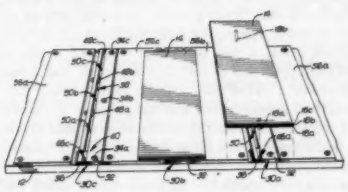
WORKPIECE HOLDING AND ALIGNMENT DEVICE

Wojciech B. Kosmowski, San Juan Capistrano, Calif., assignor to BMC Industries, Inc., St. Paul, Minn.

Division of Ser. No. 494,687, May 17, 1983, Pat. No. 4,421,305, which is a continuation of Ser. No. 236,847, Feb. 23, 1981, abandoned. This application Aug. 3, 1983, Ser. No. 519,823

Int. Cl.³ B23Q *3/00*

U.S. Cl. 29—56.6 **3 Claims**



1. A tooling apparatus for holding and tooling a workpiece

having alignment pins in an aligned position, said apparatus comprising:

a power tool;

a worktable positioned adjacent the power tool;

a first bar;

first fastener means for securely fastening the first bar to the worktable to prevent substantial movement of the first bar relative to the worktable;

a second bar;

a first spacer positioned between the first and second bars and having a predetermined width for spacing the first bar from the second bar by the predetermined width, said first spacer including an alignment aperture into which a workpiece alignment pin may be inserted;

a second spacer positioned between the first and second bars and having a predetermined width for spacing the first bar from the second bar by the predetermined width of the second spacer to thereby define a second aperture between the first and second bars into which another workpiece alignment pin may be inserted; and

second fastener means for securely fastening the second bar and the spacers to the first bar, wherein the workpiece is held in an aligned position on the worktable adjacent to the tool.

4,480,365

SUPPORT MECHANISM FOR A DRIVEN DRUM FOR FEEDING UNIFORM WIDTH TAPE IN A KNITTED TAPE MANUFACTURING DEVICE

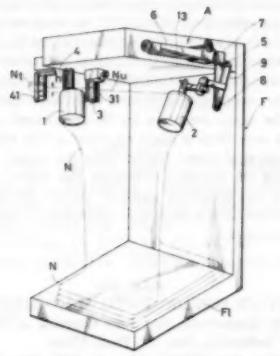
Tamotsu Sumoto, Osaka, Japan, assignor to Yugen Kaisha Manthree Shokai, Osaka, Japan

Filed Dec. 30, 1982, Ser. No. 454,686

Claims priority, application Japan, Sep. 24, 1982, 57-167188

Int. Cl.[3] **B21D** *43/00*

U.S. Cl. 29—2.1 **2 Claims**



1. In a knitted tape manufacturing device including a driving drum whose axis of rotation is substantially vertical, a driven drum, a support mechanism for the driven drum to tiltably carry the axis of rotation of the driven drum, a tension roller lying between said driving roller and said driven drum and tiltably carried in a direction different from a direction of tilt of said driven drum, a pair of cutters disposed in the neighborhood of the upper end of said driving drum, and a tape takeup rod, whereby a cylindrical knitted fabric, while the driving drum and said tension roller are being driven, is reeved in close contact around the outer circumferences of said driving drum, driven drum and tension roller and is endlessly rotated so as to continuously cut the cylindrical knitted fabric raised to an amount of a tape width by the tilted driven drum and tension roller by means of said cutters in a bias direction and to take up said cylindrical knitted fabric by said takeup rod, said support mechanism comprising:

a slide rod for adjusting the position of said driven drum horizontally;

a support rod fixed to the end of said slide rod and crossing the rod;

a vertical rod suspended from one end of said support rod;

an inverted T-shaped link journalled through a horizontal pivot pin mounted at the lower end of said vertical rod and rotatable about said pin in a vertical plane;

a means provided at the end of a lateral holding element of said link for adjusting the position of said driven drum; and

an actuating rod for rotating said link about said pivot pin in a vertical plane;

whereby said support mechanism makes it possible to freely adjust the position of said driven drum in accordance with the diameter of said driven drum and of cylindrical knitted fabric and also makes it possible for rotation of said link about said pivot pin in a vertical plane by said actuating rod to permit tilting of said driven drum substantially about an entering point in a diametrically vertical plane including said entering point by bringing the axis of said pivot point into substantial agreement with an extended line of a tangent at said entering point at which the circumferential edge of said cylindrical knitted fabric enters said driven drum.

4,480,366

VERTICAL MILLING AND TURNING MACHINES

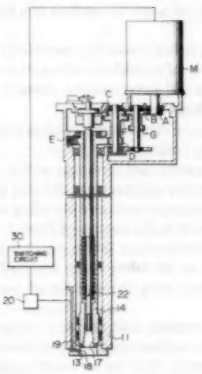
Katsuji Takahashi, Mishima; Shigeharu Fujii, Numazu, and Makoto Sagara, Mishima, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1982, Ser. No. 450,752

Claims priority, application Japan, Dec. 21, 1981, 56-206385

Int. Cl.[3] **B23C** *5/26;* **B23Q** *15/00*

U.S. Cl. 29—26 A **1 Claim**



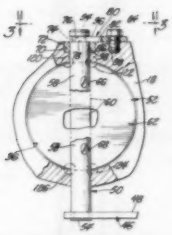
1. In a vertical milling and turning machine provided with a spindle assembly connected to a drive motor, said spindle assembly comprising a hollow ram provided with a tapered opening at the front end thereof for attaching a turning tool and a hollow spindle provided with a tapered opening at the front end thereof for attaching a milling tool, said tapered opening of the spindle being coaxial with said tapered opening of the ram and having a diameter smaller than that of the later opening, the improvement in which an air supply passage is formed in said ram so as to have an end opening opened towards said tapered opening of the ram at the rear portion of the turning tool and switch means for detecting pressure in said passage is connected to said air supply passage, said switch means being connected to said motor through a switching circuit so as to operate said spindle through said motor in accordance with a pressure detected by said pressure detecting switching means.

4,480,367

THROTTLE ASSEMBLY

Kalin S. Johnson, Northville, and Daniel E. Alsobrooks, Flat Rock, both of Mich., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,981
Int. Cl.³ B21D *53/00;* **B21K** *29/00;* **B23P** *15/26*
U.S. Cl. 29—157.1 R **17 Claims**



16. A throttle controlled induction passage assembly comprising body means, induction passage means formed through said body means, throttle shaft means extending transversely of and through said induction passage means and being carried by said body means, said throttle shaft means having an axis of rotation extending longitudinally thereof, throttle valve means fixedly carried by said throttle shaft means for rotation therewith generally within said induction passage means about said axis of rotation, said induction passage means comprising induction passage surface means, wherein said throttle shaft means in extending transversely through said induction passage means passes through first and second openings formed in said induction passage surface means, wherein said first and second openings are in axial alignment with each other and generally at opposite sides of said induction passage means, wherein said throttle valve means is fixedly carried by said throttle shaft means in a manner whereby first and second generally opposite portions of said throttle valve means are respectively juxtaposed to said first and second openings and first and second portions of said induction passage surface means respectively adjacent to and in the vicinity of said first and second openings, and abutment means for at least limiting movement of said throttle shaft means and said throttle valve means in both directions along said axis of rotation, such a limitation of movement of said throttle shaft means along said axis of rotation being to the degree whereby said first and second generally opposite portions of said throttle valve means are prevented from striking said first and second portions of said induction passage surface means respectively.

4,480,368

UNITARY INSTALLATION OF ENGINE CYLINDER LINER, PISTON AND ROD

Louis F. Vachon, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 2, 1983, Ser. No. 490,941
Int. Cl.³ B23P *15/00;* **B65D** *85/68*
U.S. Cl. 29—156.4 WL **6 Claims**

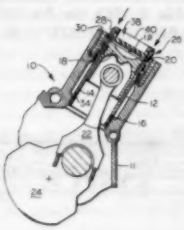
1. A method for installing a cylinder liner **(12)**, piston **(18)**, ring **(20)** and connecting rod **(22)** as a unit **(36)** into a cylinder bore **(16)** of an engine block **(11)** comprising the steps of:

assembling the cylinder liner **(12)**, piston **(18)**, ring **(20)** and connecting rod **(22)** into their operational relationship one with the other to form the unit **(36)**;

positioning a cap **(38)** on the head end **(26)** of the cylinder liner **(12)**;

establishing at least a partial vacuum between the cap **(38)** and piston **(18)** sufficient to maintain the piston **(18)** and connecting rod **(22)** in place in the cylinder liner **(12)** when unsupported;

inserting the unit **(36)** into the cylinder bore **(16)** of the engine block **(11)** in a fixed position; and



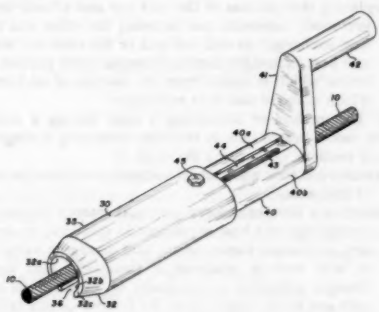
removing the cap **(38)** from the cylinder liner **(12)** while the cylinder liner **(12)** is in the cylinder bore **(16)**.

4,480,369

GRIPPING TOOL

Nicholas A. Sanders, 29 Kensington Rd., Madison, N.J. 07940, and Daniel W. Sanders, 8685 Hastings St. Northeast, Blaine, Minn. 55434

Filed Feb. 22, 1982, Ser. No. 350,991
Int. Cl.³ B25B *27/00*
U.S. Cl. 29—270 **6 Claims**



1. A gripping tool for inserting a gripper set into a wedge plate, said tool comprising:

a body comprising:

a first holding channel containing therein at least a first tendon gripper;

a second holding channel containing therein at least a second tendon gripper;

a slot extending the full length of said tool and sized to accommodate a tendon therein exclusive of said tool, said slot adjoiningly positioned between said channels, said slot being open along its entire length so as to allow said tool to be straddlingly placed on a tendon;

means for guiding a gripper from each said holding channel onto a tendon and into a wedge plate to form a gripper set; and

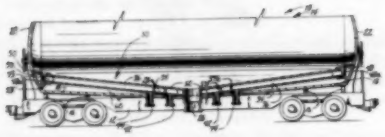
means for simultaneously ejecting a gripper from each said holding channel through said guide means into cooperative relationship with one another and a tendon.

4,480,370

HEATED RAILROAD TANK CAR

Richard P. Loevinger, P.O. Box 68, Brandon, S. Dak. 57005

Filed Jun. 7, 1982, Ser. No. 385,869
Int. Cl.³ B23K *28/00*; **B23P** *6/00, 15/00*
U.S. Cl. 29—401.1 **4 Claims**



1. The method of converting a railway tank car of generally horizontally disposed annular shape with opposite ends and an annular portion extending therebetween and having a discharge valve assembly; the steps of:

removing at least a portion of one end of said tank car,

inserting an elongated arcuately-shaped heat exchanger into said tank car through said one end,

positioning said heat exchanger in said tank car so that said heat exchanger extends continuously incliningly downwardly between the side walls of said annular portion above the bottom of said tank car, with a portion of the heat exchanger being in substantially encompassing heat exchange relationship with the discharge valve assembly within the container, providing an inlet and an outlet in the tank adjacent said discharge valve assembly for the inlet and the outlet in said heat exchanger to permit a heated medium to be passed through said heat exchanger to heat the lading in said tank car,

securing one end of the heat exchanger adjacent said discharge valve assembly,

securing sides of said heat exchanger to said annular portion,

replacing that portion of the said one end of said tank car previously removed, and securing the other end of said heat exchanger to said one end of the tank car whereby said heat exchanger creates a compartment portion therebelow which is sealed from the interior of said tank car which is above said heat exchanger.

2. The method of converting a tank, having a discharge valve, into a heated tank to facilitate dispensing a congealable stored medium, comprising the steps of:

removing at least a portion of said tank to expose the interior of said tank,

inserting a heat exchanger into said interior of said tank, positioning said heat exchanger in said tank so that said heat exchanger slants toward said discharge valve and is in heat transfer relationship therewith, said heat exchanger extending continuously on inside walls of said tank and being spaced from the bottom of said tank, said heat exchanger encompassing at least a portion of said discharge valve,

providing an inlet and an outlet in said heat exchanger, adjacent said discharge valve,

securing peripheral edges of the heat exchanger to the interior walls of said tank whereby said heat exchanger creates a sealed compartment defining a dead air space and

replacing said removed portion of the tank.

4,480,371

METHOD OF MAKING INSULATED TUBULAR CONDUIT

David M. McStravick, and David V. Chenoweth, both of Houston, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Division of Ser. No. 272,411, Jun. 10, 1981, Pat. No. 4,396,211. This application Jul. 13, 1983, Ser. No. 513,456
Int. Cl.³ B21D *39/00*; **D03D** *49/26*; **F16L** *11/12*
U.S. Cl. 29—455 R **14 Claims**

1. A method of fabricating a concentric walled insulating tubular conduit for use in a subterranean well comprising the steps of: outwardly flaring the upset, enlarged ends of a tubular member initially having a nominal thickness intermediate the ends thereof and a greater thickness at the enlarged ends thereof by forging said ends using a swage having a mirror

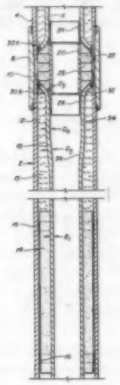


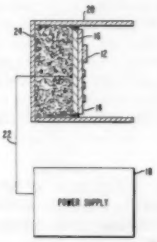
image profile; inserting the inner tubular member into an outer tubular member; and attaching said flared ends to said outer conduit to form a concentric walled tubular conduit having an annular cavity between the inner and outer tubular members.

4,480,372

PROCESS OF FABRICATING TARGET FOR CALIBRATING AND TESTING INFRARED DETECTION DEVICES

Michael P. Wirick, Los Angeles, and James P. Wright, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 255,966, Apr. 20, 1981, Pat. No. 4,387,301. This application Apr. 25, 1983, Ser. No. 471,081
Int. Cl.³ B23P *25/00*
U.S. Cl. 29—458 **12 Claims**



1. A process for fabricating apparatus for calibrating and testing infrared detection devices comprising

(a) providing a heat conducting substrate having a front surface and a back surface;

(b) forming on at least a region of said front surface of said substrate a target pattern comprising dielectric material, said dielectric material being at least partially absorbing to infrared radiation; and

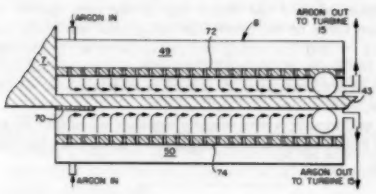
(c) assembling on the back side of said substrate a heating means that developes heat sufficient to heat said back surface of said substrate such that at least one apparent differential temperature contrast between said target pattern and said substrate will be obtained.

4,480,373

STEEL MAKING METHOD

Ernest S. Geskin, Townhouse #3, Meadow East, Potsdam, N.Y. 13676

Division of Ser. No. 216,643, Dec. 15, 1980, Pat. No. 4,434,003.
This application Sep. 27, 1982, Ser. No. 423,655
Int. Cl.[3] B22D *11/126*
U.S. Cl. 29—527.3 4 Claims



1. A process for forming sheet metal from a metal melt comprising:

providing two parallel plates defining a space therebetween, at least one of said plates being provided with a plurality of aperatures;

forcing the metal melt through a slot-shaped orifice into said space;

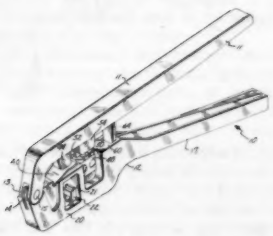
injecting an inert gas through said aperatures to cool and solidify the metal and to maintain the metal spaced from said one plate.

4,480,374

COMMUNICATION PLUG CONNECTION TOOL

Daniel Meyer, Hector, Minn., assignor to Communication Systems, Inc., Hector, Minn.

Filed Oct. 22, 1982, Ser. No. 435,899
Int. Cl.[3] H01R *43/04*
U.S. Cl. 29—566.4 6 Claims



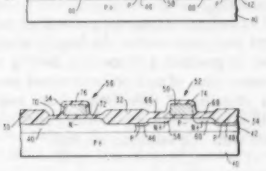
1. A hand tool for connecting a communications plug to a communications cord having a plurality of conductors in such cord arranged in a known relationship, said tool comprising a pair of handle members pivotally mounted together adjacent one end thereof, and diverging so that the opposite ends of the handle members can be moved toward and away from each other, a first of the handle members having an integral mounting block portion between the pivot and the opposite end thereof, said block portion having a receptacle formed therein for receiving a communication plug and cord which are to be connected, said receptacle having a laterally facing plug receiving opening on one side of the block member so a plug to be worked on may be inserted in direction generally parallel to the pivotal axis of handle members, said block portion further having a pair of passageways extending from a surface of the first handle member facing a second of the handle members and opening into the receptacle, said passageways being aligned with desired portions of a plug held in said receptacle and extending at substantially right angles to the direction of insertion of a plug into the receptacle, a pin slidably mounted in one of said passageways in said block, a punch slidably mounted in the other of said passageways in said block, said pin and punch each having a head member positioned on the exterior surface of the block on a side of the block facing the second handle member and adjacent the second handle member, means coupled to said pin and punch for causing movement thereof in direction away from said receptacle when the handle members separate including a spring for urging the pin and punch to move away from the receptacle and the handle members to separate, and an actuator lug mounted on the second of said handle members adapted to slidably engage and bear against both the head of the pin and the head of the punch, said handle members being movable toward each other to force the pin and the punch toward a plug held in the receptacle to engage members on the plug and connect the cord to the plug.

4,480,375

SIMPLE PROCESS FOR MAKING COMPLEMENTARY TRANSISTORS

Peter E. Cottrell, and Henry J. Geipel, Jr., both of Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,124
Int. Cl.[3] H01L *21/22, 29/78, 21/263*
U.S. Cl. 29—576 B 17 Claims



1. A method of making a complementary metal oxide semiconductor (CMOS) structure comprising the steps of:

forming a first oxidizable gate electrode for an N channel device on a first portion of a semiconductor substrate and a second oxidizable gate electrode for a P channel device on a second portion of said substrate,

masking the second portion of said substrate,

implanting N type ions into said first portion aligned with the edges of said first gate electrode to form source and drain regions for said N channel device,

removing the masking material from said second portion,

oxidizing the surface of said substrate without said gate electrodes and the exposed surfaces of said first and second gate electrodes to form a first oxide layer on the edges of said gate electrodes, a second oxide layer over said N channel device source and drain regions and a third oxide layer over the second portion of said substrate, said second oxide layer being thicker than said third oxide layer, and

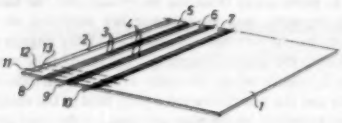
introducing P type ions into the first and second portions of said substrate aligned with the edges of the oxide layers on said gate electrodes so as to form source and drain regions for said P channel device, whereby a given number of P type ions per unit area is disposed within said P channel device source and drain regions and a lesser number than said given number of P type ions per unit area is disposed within said N channel device source and drain regions.

4,480,376

THERMISTORS, THEIR METHOD OF PRODUCTION

Bo H. Hakanson, Lund, Sweden, assignor to Crafon Medical AB, Sweden

Filed Apr. 13, 1982, Ser. No. 367,932
Claims priority, application Sweden, Apr. 15, 1981, 8102428
Int. Cl.³ H01C *17/00, 17/06*
U.S. Cl. 29—593 **12 Claims**



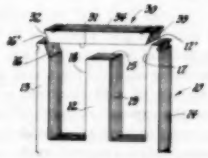
1. A method for producing thermistors having a predetermined resistance value at a predetermined temperature, comprising a sheet of electrically non-conductive material, applying a layer of electrically conductive material to said sheet of electrically non-conductive material in a repeating, spaced pattern so as to produce a plurality of electrically conductive material portions and a plurality of spaces therebetween, applying a plurality of layers of thermistor material to said plurality of spaces between said plurality of electrically conductive material portions on said sheet of electrically non-conductive material so as to bridge said plurality of spaces between said plurality of electrically conductive material portions and produce a plurality of thermistor strips having a substantially constant resistance along their length, said plurality of thermistor strips comprising said layers of thermistor material applied to said plurality of spaces and a pair of electrically conductive material portions on either side thereof, measuring the resistance value of said plurality of thermistor strips across said pair of electrically conductive material portions, determining from said measured resistance values the length of said thermistor strip required to produce a thermistor having said predetermined resistance value of said predetermined temperature and producing a plurality of thermistors from said plurality of thermistor strips by transversely dividing said thermistor strips in accordance with said required lengths.

4,480,377

METHOD OF MAKING AN IGNITION COIL CORE

Ronnalee House, and Roger W. Kellams, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 27, 1982, Ser. No. 424,465
Int. Cl.³ H01F *41/02, 27/26*
U.S. Cl. 29—593 **2 Claims**



1. A method of making a laminated core for an ignition coil with an air gap from first and second laminated members, the first laminated member having an E shape with a pair of resiliently bendable outer legs and a shorter center leg and oblique surfaces on the inner free ends of the outer legs forming equal angles with a surface of the center leg, the second laminated member having a bar shape with oblique surfaces at the ends thereof forming equal angles with said surface of the center leg greater than the corresponding angles of the oblique surfaces of the first laminated member when the second laminated member is oriented perpendicularly to said center leg, the method comprising the following steps:

assembling a coil of electrically conducting wire around the center leg of the first laminated member;

orienting the second laminated member perpendicularly to the center leg of the first with at least portions of the oblique surfaces of the laminated members in physical contact to form a magnetic circuit with an air gap;

reducing said air gap by advancing the second laminated member toward the center leg of the first against the return force of the outer legs being bent resiliently outward by said contacting oblique surfaces while monitoring by means of said coil a physical parameter indicative of a desired magnetic or electrical characteristic or said core; and

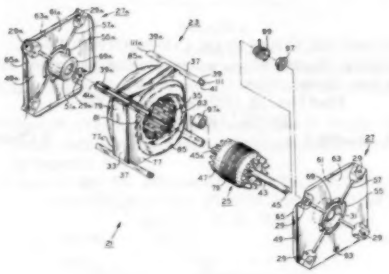
fixing said members permanently together when said parameter indicates the desired magnetic or electrical characteristic.

4,480,378

METHOD OF ASSEMBLING A DYNAMOELECTRIC MACHINE AND METHOD OF SECURING A SET OF BEAMS OF A STATIONARY ASSEMBLY FOR A DYNAMOELECTRIC MACHINE TO OPPOSITE END FRAMES THEREFOR

Robert W. White, and Frank R. Kuzan, both of DeKalb, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jul. 27, 1982, Ser. No. 402,282
Int. Cl.³ H02K *15/14, 15/16*
U.S. Cl. 29—596 **40 Claims**



1. A method of assembling a dynamoelectric machine having a stationary assembly including first and second opposite end frames having first and second bearings associated therewith and with first and second thrust surfaces on the first and second bearings, respectively, at least the first end frame having a generally central opening therethrough generally in coaxial alignment with the first bearing, first and second sets of apertures extending generally axially through the first and second end frames, a stator having a generally axial bore therethrough, a set of beams secured to the stator with the beams having first and second opposite ends with first and second tabs extending generally axially from the first and second opposite ends of the beams, respectively, and the dynamoelectric machine also having a rotatable assembly including a shaft having first and second opposite end portions, a rotor secured to the shaft between the first and second shaft end portions, a first thrust collar, a thrust spring, and a second thrust collar secured to the second shaft end portion, the method comprising the steps of:

locating the first end frame generally in a preselected position;

arranging the first thrust collar and the thrust spring on the first shaft end portion with the thrust spring engaged between the first thrust collar and a part of the rotor at least adjacent the first shaft end portion;

inserting the first shaft end portion through the first bearing and the opening in the first end frame;
engaging the first thrust collar on the first shaft end portion with the first thrust surface on the first bearing;
moving the first shaft end portion further through the first bearing and the opening in the first end frame toward a preselected position with respect thereto;
compressing the spring means between the rotor part and the first thrust collar in its engagement with first thrust surface on the first bearing as the first shaft end portion is moved toward its preselected position;
locking the first shaft end portion in its preselected position;
positioning a set of shims generally about the rotor;
arranging the stator bore generally about the rotor and the shim set with the shim set in shimming engagement therebetween;
passing the first tabs on the first opposite ends of the beams at least in part into the first apertures in the first end shield generally upon the arranging of the stator bore about the rotor and shim set;
seating the first opposite end of at least one of the beams against the first end frame upon the passing of the first tabs on the beams at least in part into the first apertures in the first end frame;
adjusting concurrently the stator and beams with respect to the first end frame so as to arrange the first tabs on the beams in spaced apart relation from the first apertures in the first end frame, respectively;
receiving the second shaft extension in the second bearing associated with the second end frame;
passing the second apertures in the second end frame generally about the second tabs on the second opposite ends of the beams, respectively;
seating the second opposite end of at least two of the beams against the second end frame upon the passing of the second apertures thereof about the second tabs on the beams;
adjusting the second end frame with respect to the beams so as to arrange the second apertures in the second end frame in spaced apart relation from the second tabs on the beams, respectively;
loading resiliently the second end frame in a direction toward the second opposite ends of the beams;
unlocking the first shaft end portion;
moving the first and second shaft end portions in the first and second bearings and also the rotor in the stator bore in response to the compressive force of the thrust spring upon the unlocking of the first shaft end portion;
engaging the second thrust collar with the second thrust surface of the second bearing associated with the second end frame upon the occurrence of the second moving step;
welding generally simultaneously the first and second end frames at least generally adjacent each of the first and second apertures therein to at least a part of each of the tabs extending at least in part into the first and second apertures; and
removing the shim set from the shimming engagement thereof between the rotor and the stator bore.

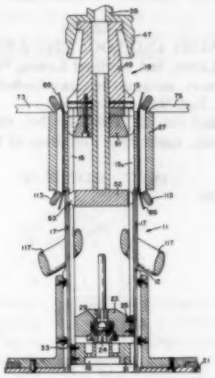
4,480,379

STACK HEIGHT ADJUSTMENT FOR COIL PLACING MACHINES

Keith A. Witwer, Fort Wayne, Ind., assignor to Industra Products, Inc., Fort Wayne, Ind.

Filed Apr. 28, 1983, Ser. No. 489,515
Int. Cl.³ H02K *15/10*
U.S. Cl. 29—596 **20 Claims**

1. In a coil placing method using a machine having a plurality of generally parallel upstanding finger elements supported on a shaft and disposed generally in a circular pattern for supporting coils and a magnetic core into which the coils are to be placed, a reciprocablE ram, and a reciprocable ram actuated stripper selectively separable from the ram and movable axially along the finger elements from a home position to engage and move the coils into the magnetic core, the improved method of adapting the machine to accommodate magnetic cores of differing sizes comprising the steps of:
mechanically coupling a portion of the finger support shaft and a portion of the stripper actuating ram together to prevent relative rotation between the coupled portions;
imparting a corotational motion to the coupled portions



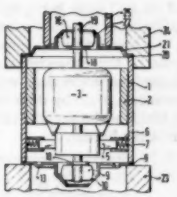
while holding the stripper and finger elements rotationally fixed so that a threaded interconnection coupling the fingers to the finger support shaft portion moves the fingers and the stripper home position axially relative to the finger support shaft portion and a threaded interconnection coupling the stripper to the stripper actuating ram portion moves the stripper axially relative to the stripper actuating ram portion.

4,480,380

MOUNTING ARRANGEMENT FOR ELECTROMOTOR

Ernst Horrwarth, Achern; Karl Schweikert, and Hans J. Weckerle, both of Bühl, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 150,407, May 13, 1980,. This application Apr. 29, 1983, Ser. No. 489,843
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922676
Int. Cl.³ H02K *15/14*
U.S. Cl. 29—736 **3 Claims**



1. An adjusting device for eliminating axial play in an assembled electromotor including an elongated shaft and mounted within a housing, a pair of bearings positioned on the opposite ends of said shaft, and a pair of opposite bearing covers closing the housing at the opposite ends thereof and each including an edge portion, a dome-shaped central portion and an intermediate portion formed between said edge portion and said central portion, the adjusting device comprising a support member mountable in contact with the edge portion of one bearing cover for supporting one end of the assembled electromotor; at

least one press pad element mountable in contact with the edge portion of another bearing cover to support another end of the assembled electromotor; and at least one stamp mountable in contact with the intermediate portion of said another bearing cover and near the central portion thereof to push the assembled electromotor against said support member in the direction of elongation of said shaft to thereby eliminate axial play which may occur in the assembled electromotor.

4,480,381

ALIGNING AND LOCATING APPARATUS

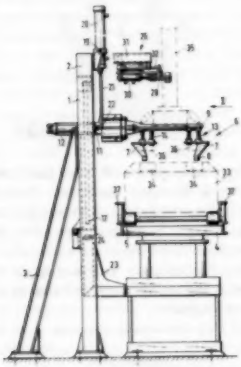
Erwin Collet, Lünen, and Heribert Loweg, Werne, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,508

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206498

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—746 **18 Claims**



1. Apparatus for aligning and locating a block and a holder therefor, the block having a plurality of blind bores formed in one surface thereof for receiving complementary projections provided on the holder, the apparatus comprising a stand, a support table for supporting the block, said table being mounted on the stand for movement relative thereto, alignment means mounted on the stand above the table, said alignment means having a plurality of alignment elements, each alignment element having the shape of a segment of a funnel, the arrangement of said alignment means in relation to the block supported on said table being such that the narrow end of each of the alignment elements is introduced into a respective bore in the block as the table is moved upwardly, and such that at least some of the projections of a holder positioned above the alignment means engage within the wider ends of the alignment elements, thereby directing the projections into the bores of the block as the support table subsequently moves upwardly towards the holder.

4,480,382

FEED MEANS FOR ELONGATE ARTICLES

Leonard Haigh, Evesham, and Robert H. Morrison, Wimborne, both of England, assignors to Needle Industries Limited, Studley, England

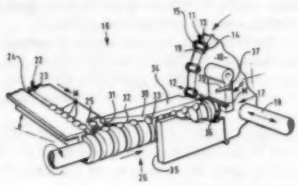
Filed Jul. 23, 1982, Ser. No. 401,313

Claims priority, application United Kingdom, Jul. 25, 1981, 8123017

Int. Cl.³ B23P *21/00, 19/00*; B65G *47/24*

U.S. Cl. 29—786 **14 Claims**

4. A machine for assembling a blind rivet comprising a hollow rivet and a mandrel comprising an elongate shank with a head at one end, said machine including a feed means comprising an inclined track comprising a pair of parallel shoulders affording a slot therebetween so that, in use, a head of a mandrel is supported on the shoulders with its shank depending downwardly through the slot and, at the lower end of the track, a feed member mounted for rotation and having a helical groove therein of such configuration as to permit a mandrel to enter the groove and to be transported along the groove between the feed member and the lower end of the track in a



transverse direction and there being an abutment surface adapted to engage a mandrel to move the mandrel from the orientation it has when it becomes engaged with the feed member to a generally horizontal orientation at a receiving station to which it is transported by the feed member, means to feed in succession a plurality of said hollow rivets to an assembly station, and means to move a mandrel in its axial direction out of engagement with the feed member and into a hollow rivet presented thereto at the assembly station.

4,480,383

AUTOMATIC ASSEMBLING APPARATUS FOR UNIFORM-SPEED JOINT

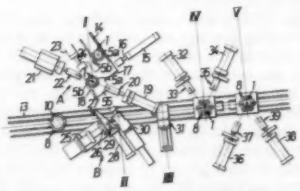
Teruo Yoshioka; Toshio Miyazawa, both of Kawagoe; Kuninobu Uchida, Tokyo, and Akimichi Asai, Tsurugashima, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1982, Ser. No. 443,119

Claims priority, application Japan, Nov. 19, 1981, 56-185668

Int. Cl.³ B23P *19/00*; F16D *3/00*

U.S. Cl. 29—822 **7 Claims**



1. An apparatus for assembling a uniform-speed joint having an inner rotary body and an outer rotary body which transmits a rotational force from one to the other through a plurality of small spheres disposed in receiving holes in the outer peripheral surface of said inner rotary body, said apparatus comprising:

(a) carrying means for carrying said outer rotary body such that the inner surface of said rotary body is oriented upward;

(b) guide means including a first guide wall, a second guide wall and pusher means for pushing an inner rotary body along said first guide wall until it contacts said second guide wall;

(c) first press fitting means for press fitting two small spheres into diametrically opposed receiving holes in said inner body;

(d) clamping means for clamping said inner rotary body, orienting the axis of said inner rotary body perpendicular to the axis of said outer rotary body on said carrying

means, and inserting said inner rotary body into said outer rotary body

(e) correcting means for orienting the inner rotary body with respect to the outer rotary body such that the axis of the inner rotary body coincides with the axis of the outer rotary body;

(f) swing means for rotating said inner rotary body in said outer rotary body such that at least one of said receiving holes is above the top edge of said outer rotary body; and

(g) second press fitting means for pressing said small spheres into said receiving holes above the top edge.

4,480,384

METHOD OF ATTACHING A RESONATOR CASING TO A PRINTED CIRCUIT

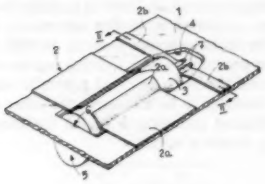
Jean Bolzt, Neuchatel, and Jean-Pierre Calame, La-Chaux-de-Fonds, both of Switzerland, assignors to Fabriques d'Horlogerie de Fontainemelon S.A., Fontainemelon, Switzerland

Filed Feb. 23, 1982, Ser. No. 351,098

Claims priority, application Switzerland, Feb. 23, 1981, 1183/81

Int. Cl.³ H05K *3/30, 3/34*

U.S. Cl. 29—840 **9 Claims**



1. A method for fixing a resonator casing having a longitudinal axis to a printed circuit of a timepiece, said printed circuit comprising an insulating substrate and a conductive layer forming a plurality of conductive tracks, the method comprising the steps of:

forming in said insulating substrate an opening having a shape that enables said casing to be inserted at least partly therein;

forming in said conductive layer at least one fixing lug means integral with said layer, said fixing lug means extending over said opening and over at least a portion of such a casing; inserting said casing in said opening; shaping said at least one fixing lug means to form a cradle for said casing by engaging said casing in said opening with said longitudinal axis substantially parallel to the plane of said opening and bringing said casing into contact with said at least one fixing lug means to deform said at least one fixing lug means into said cradle; and

mechanically joining said at least one fixing lug means to the portion of said casing in contact with said cradle.

4,480,385

TOOL AND METHOD FOR TERMINATING ELECTRICAL CONDUCTORS IN CONTACT MEMBERS

Joseph Dragisic, Cicero, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 11, 1979, Ser. No. 83,872

Int. Cl.³ H01R *43/04;* **B23P** *19/00*

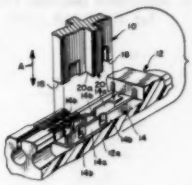
U.S. Cl. 29—866 **28 Claims**

1. A method of terminating an electrical conductor to a contact member premounted in an electrical connector, said contact member having a terminal portion including at least one conductor engaging element, said method comprising the steps of:

inserting the conductor into the contact member by engaging the conductor in line with said element to seat the conductor within said terminal portion and make electrical engagement between the conductor and said element; and simultaneously

shearing a segment of the contact member from a wall of said terminal portion other than said element and forming the sheared segment onto said conductor to mechanically retain said conductor in electrical engagement with said contact member.

17. A tool for terminating an insulated conductor into a portion of an electrical contact which has an outwardly open channel formed by a pair of contact sidewalls and at least one conductor engaging element, comprising:



a member including insertion means aligned with said element for engaging and inserting a conductor into said channel and make electrical engagement between the conductor and said element; and

crimping means on said member for engaging and shearing wall portions of said contact sidewalls other than said element simultaneously with the insertion of the conductor by said insertion means into engagement with said element, and forming the sheared wall portions onto the inserted conductor within said channel.

4,480,386

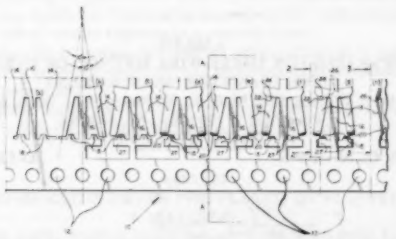
PROCESS FOR PRODUCING DUAL BEAM ELECTRICAL CONTACT

John E. Adams, Mechanicsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 8, 1982, Ser. No. 396,277

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—874 **6 Claims**



1. In a process for producing a preloaded dual beam female electrical contact from flat metal stock having prepunched pilot holes the improvement comprising

(a) stamping out a pair of beams in a flat plane one beam on each side of a spine at an angle of about 10° with respect to the spine, each beam having a first and second end, the first end making the angle with the spine and the second end being adjacent to a tab in the same plane stamped out of the strip stock, each tab being parallel to the spine and located on a finger projecting from opposite sides of the spine,

(b) forming a contact surface at the second end of each beam in a direction away from its corresponding tab,

(c) forming the tab to create a preload stop,

(d) forming the tab carrying fingers projecting from the

spine into a box to provide an entrance way for a pin contact, and

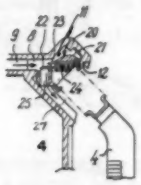
(e) forming the beams at their first end in a direction upward from the flat plane at acute angles and then about 90° with respect to the spine to form a U shaped body.

4,480,387

CLEANING DEVICE FOR RAZORS

Stephane M. d'Alayer de Costemore d'Arc, Ways, Belgium, assignor to Staar S. A., Belgium

Continuation-in-part of Ser. No. 310,988, Oct. 13, 1981, abandoned. This application Jan. 22, 1982, Ser. No. 341,783
Claims priority, application Belgium, Oct. 24, 1980, 885,872
Int. Cl.³ B26B *19/44*
U.S. Cl. 30—41 **13 Claims**



1. A cleaning device for razor cartridges having an exterior face with at least one blade projecting therefrom and water passages extending inwardly from said exterior face through said cartridge past said blade comprising:

a casing having a socket into which a cartridge may be inserted to a fixed position with the outer edges of said cartridge adjacent the walls of said socket and with said exterior face opposite a bottom portion of said socket;

an inlet in said casing for water;

channel means for directing the flow of water from said inlet into said bottom portion of said socket;

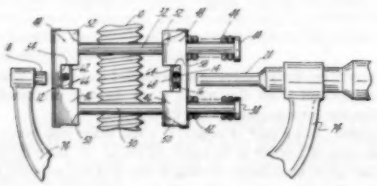
means for locking the cartridge in said fixed position in said socket such that water channeled from said inlet is directed into said socket by said channel means and toward said cartridge against the edge of a blade of said cartridge and is substantially confined to escape from the socket by passing inwardly through said passages in the cartridge to flush soap and shaving residue accumulated in and around said blade.

4,480,388

APPARATUS FOR THREE-WIRE METHOD OF THREAD PITCH DIAMETER MEASUREMENT

Orlin P. O'Brien, 9205 Main St., Whitmore Lake, Mich. 48189

Filed May 2, 1983, Ser. No. 490,561
Int. Cl.³ G01B *3/40*
U.S. Cl. 33—199 R **13 Claims**



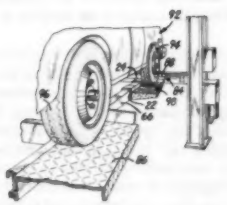
1. Apparatus for the three-wire measurement of thread pitch diameter comprising in combination with three wires a holder comprising two separate holder elements for disposition on diametrically opposite sides of a thread whose pitch diameter is to be measured by the three-wire method, means mounting said two holder elements such that they are guided for relative straight line movement toward and away from each other in a direction aligned with the thread pitch diameter to be measured, said holder elements comprising parallel wire-engaging surfaces confronting each other and having extents at 90° to the direction of said relative straight line movement, one of said three wires being disposed against the wire-engaging surface of one of said holder elements and the remaining two wires being disposed against the wire-engaging surface of the other of said holder elements, retention means removably retaining said one wire on its corresponding holder element, further retention means removably retaining said remaining two wires on their corresponding holder element, and apertures extending through said wire-engaging surfaces of said holder elements in alignment with the thread pitch diameter to be measured, said wires passing across said apertures as viewed through said apertures, and said apertures providing access for a measuring instrument to be engaged with the three wires across the thread pitch diameter to be measured, each said holder element being of a generally rectangular shape with the two holder elements being aligned with each other corner-to-corner, each holder element including projections at its four corners projecting toward the four corners of the other holder element along the direction of said straight line movement so that when said holder elements are in abutment with each other at their projections, said parallel wire-engaging surfaces are spaced apart, and in which the four projections of each said holder element cooperatively define intersecting slots which face toward the opposite holder element, one slot of each said holder element providing a wire locating region within which a wire so located therein is oriented generally tangent to the thread pitch diameter to be measured, the other slot of each said holder element providing a region for location of the corresponding retention means.

4,480,389

WHEEL ALIGNMENT SYSTEM

Ralph Capovilla, 4 Hamilton Pl., Pine Brook, N.J. 07058

Filed Jul. 11, 1983, Ser. No. 512,903
Int. Cl.³ G01B *5/255*
U.S. Cl. 33—203.12 **3 Claims**



1. An improved wheel alignment system including a frame bed having a pair of longitudinally extending members, means for positioning a vehicle on and off the frame bed, two bed plates, each including a top surface upon which the drive wheels of the vehicle come to rest, and two wheel alignment tools, said system further characterized by:

(a) two base plates;

(b) means for suspending each of said base plates from a corresponding one of the longitudinally extending members, said means for suspending having a pre-determined design, such that the top surfaces of each said base plate are located at a prescribed distance below the plane of the top surface of the bed plates, each said base plate having a respective wheel alignment tool disposed thereon, positionable beneath a respective one of the free wheels of the vehicle when said vehicle is a rear wheel drive vehicle, said prescribed distance such that the top surface of each said wheel alignment tool positioned on a respective base

plate is approximately level with the top surface of the bed plates; and

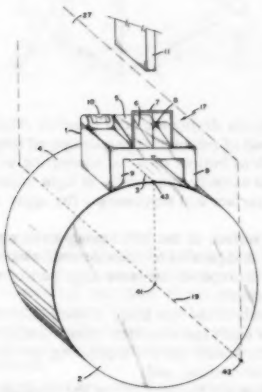
(c) two adapter plates, each of said adapter plates removably disposable on a respective base plate, each said adapter plate disposed on a respective base plate when the vehicle is a front wheel drive vehicle, the composite of the adapter plate—base plate positionable under the free wheels of the vehicle when the vehicle is a front wheel drive, each wheel alignment tool removably disposable on a respective bed plate and positionable under a respective drive wheel of the vehicle when the vehicle is a front wheel drive, said adapter plates having a prescribed height such that the top surface of each said adapter plate when disposed on a respective base plate is approximately level with the top surface of the wheel alignment tool disposed on a bed plate.

4,480,390

APPARATUS AND METHOD FOR ALIGNING AN OBJECT WITH RESPECT TO TOP-DEAD CENTER OF A WHEEL

Frissora Anthony P., Mendham, and Ralph R. Saunders, Lafayette, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 20, 1982, Ser. No. 419,675
Int. Cl.³ G01B *11/26*
U.S. Cl. 33—286 **7 Claims**



1. An optical alignment apparaus adapted to align a selected object with respect to a top-dead-center portion of a substantially circular wheel, comprising:

(a) a base adapted to mount on said wheel and having a top surface longitudinal dimension;

(b) positioning means for aligning said base with said wheel top-dead-center portion, said positioning means comprised of two leg elements connected to said base and adapted to provide a substantially horizontal orientation of said longitudinal dimension when the transverse center line of said base is aligned over said wheel top-dead-center and a bubble level indicator for indicating said horizontal orientation of said base;

(c) a mirror mounted on said base and aligned with said wheel top-dead-center to reflect an image of said object;

(d) a reference line located coplanar with a plane defined by a first point at the center of said wheel, a second point on the axis of rotation of said wheel and a third point at said wheel top-dead-center for indicating the relative alignment of said object with respect to said wheel top-dead-center; and

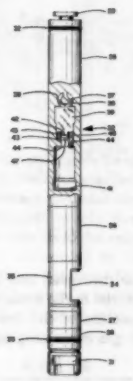
(e) a sighting line, which can be placed in visual alignment with said mirror and reference line to observe and determine the relative alignment of said image with respect to said reference line.

4,480,391

BOREHOLE SURVEY INSTRUMENT CONTROL CIRCUITRY

Harper E. Sharp, and Miles A. Smither, both of Houston, Tex., assignors to Wilson Industries, Inc., Houston, Tex.

Filed Dec. 3, 1982, Ser. No. 446,630
Int. Cl.³ E21B *47/022*
U.S. Cl. 33—314 **9 Claims**



1. A wellbore survey instrument for recording selected wellbore parameters, said instrument comprising:

elongated housing means adapted to be lowered into a wellbore;

indicating means mounted to move within said housing means;

photographic recording means fixed within said housing means and axially displaced from said indicating means;

indicia disposed on said indicating means for indicating the angular position of said indicating means with respect to said housing means;

a plurality of illuminating means disposed within said housing means for illuminating said indicia for a selected period of time in response to a control signal;

means for increasing said selected period of time in response to a failure to one or more of said plurality of illuminating means; and

optical means for focusing the illuminated image of said indicia on said photographic recording means.

4,480,392

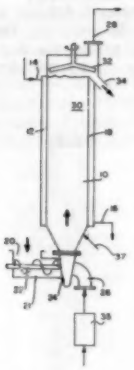
CONDUCTION DRYER FOR FLAKED OR FLUFFED MATERIAL

Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 18, 1982, Ser. No. 340,099
Int. Cl.³ F26B *3/08, 17/10*
U.S. Cl. 34—10 **7 Claims**

1. A dryer for drying wet flaked or fluffed fibrous or peat-like material comprising: at least one vessel; a material inlet; a material outlet vertically spaced above the material inlet; means for heating the outside of the vessel, which heat is conducted through the shell of the vessel to dry wet material in the vessel as all the wet material is moved from the material inlet to a height adjacent the material outlet; means including a material transporting gas inlet for the admission of material transporting gas at a predetermined pressure into the lower section of the vessel, the material transporting gas being primarily used to continuously move all the material in the form

of a loose material bed from the material inlet to a height adjacent the material outlet; mechanical means for removing all the material from the vessel through the material outlet; high pressure gas pulse generating means; and means for feeding high pressure gas pulses from the high pressure gas pulse



generating means into the vessel and into the loose material bed to agitate the material in the loose material bed; and a gas outlet in the upper section of the vessel above the material outlet through which gas containing moisture leaves the vessel.

4,480,393

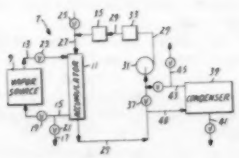
VAPOR RECOVERY METHOD AND APPARATUS

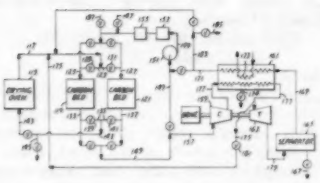
Leslie R. Flink, New Brighton; Bryce J. Fox, Shoreview, and Mary K. Witzel, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 15, 1981, Ser. No. 273,962

Int. Cl.³ F26B *3/04*

U.S. Cl. 34—27 **25 Claims**





1. A method of recovering condensable vapor contained in a gas stream, said method consisting essentially of

(a) introducing said gas stream into a concentrating means comprising a fixed or moving bed accumulating means wherein said vapor is separated from said gas and temporarily retained.

(b) admixing at least a portion of the vapor retained in said accumulating means with a second noncondensable carrier gas whereby the average concentration of condensable vapor in said carrier gas is greater tuan the average concentration of condensable vapor in said first gaseous medium, and

(c) refrigerating only a portion of said vapor-containing carrier gas to cause condensation of at least a portion of said condensable vapor therein and recovering said condensate.

4,480,394

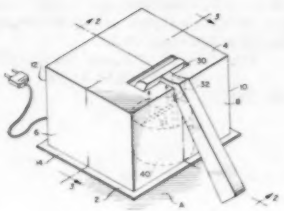
DRYER FOR SAFETY RAZOR

Edelmiro A. Salas, Temple E-18, Santa Ana, Río Piedras, P.R. 00927

Filed Mar. 29, 1983, Ser. No. 479,907

Int. Cl.³ F26B *9/06*

U.S. Cl. 34—202 **1 Claim**



1. A device for drying the head of safety razor, comprising a hollow box of rectangular parallelopiped shape adapted to rest with its bottom on a flat supporting surface with its side wall extending upwardly at right angles to the supporting surface and supporting a flat upper surface of the box,

the upper surface of the box having an elongated opening adjacent and parallel to one side wall which is of a shape and size to receive the razor edge part of the head of a safety razor,

the side walls of the box being of such uniform height that the razor blade end of a safety razor standing with the free end of its handle on the supporting surface is received within the opening, and

means within the box and below the opening in the upper surface for directing a stream of hot air upwardly onto the razor blade head within the opening.

4,480,395

CLOSURE FOR SHOES, ESPECIALLY SKI BOOTS

Robert Schoch, Hilzingen, Fed. Rep. of Germany, assignor to Weinmann GmbH & Co. KG and Fahrrad-und Motorrad-Teilefabrik Im Haselbusch, both of, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 440,836

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148527

Int. Cl.³ A43B *11/00*

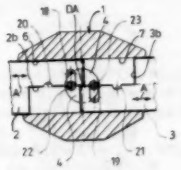
U.S. Cl. 36—50 **10 Claims**

1. A closure for a ski boot or the like having a pair of pull straps adapted for connection at corresponding ends to parts of the boot and an actuating member rotatable about an axis having two driving members arranged eccentrically with reference to the axis of rotation of the actuating member is characterized in that:

a. the width of the opposite ends of the pull straps is about one-half the width of said corresponding ends thereof extend alongside and adjacent to each other;

b. each of said pull straps has a groove in its narrower end

which is open towards the other pull strap and has a depth corresponding to the eccentricity of the driving members; and



c. the driving members of the actuating member are accommodated in the grooves.

4,480,396

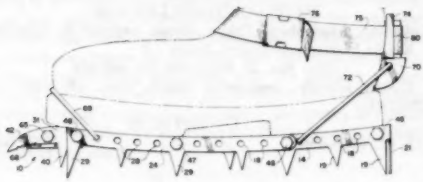
CRAMPON CONSTRUCTION AND METHOD OF ATTACHMENT

Greg E. Lowe, 2560 Buchanan, Ogden, Utah 84401, and Michael R. Lowe, Box 361, Homestead House, Eldorado Springs, Colo. 80025

Continuation-in-part of Ser. No. 004,635, Jan. 19, 1979, abandoned. This application Oct. 29, 1979, Ser. No. 89,327

Int. Cl.³ A43C *15/06*; A63B *29/00*

U.S. Cl. 36—7.6 **18 Claims**



1. A crampon comprising:

a pair of elongated substantially linear side units each formed of at least one beam member having a linear row of pointed projections extending therefrom in a common direction and positioned along a substantially straight line, and a plurality of holes defined therethrough in a direction perpendicular to the direction in which the pointed projections extend;

a unitary spacer member positioned between and substantially filling the volume between the side units to position the side units and rows of pointed projections thereon in a substantially parallel relationship; and

fastener means extending through aligned holes in the beam members comprising opposite side units and securing the side units and interposed spacer member together;

whereby the crampon will afford improved traction as a result of the aligned pointed projections.

4,480,397

SNOWBLOWER TRUCK ASSEMBLY AND LATERAL SWIVELLING SNOWBLOWER EQUIPMENT THEREFOR

René Vachon, 318A St. Raphaël St., Valleyfield, Canada (J6T 3A6)

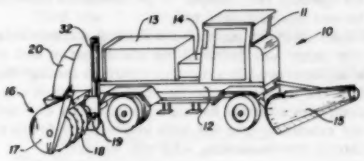
Filed Jun. 13, 1983, Ser. No. 503,863

Claims priority, application Canada, Mar. 4, 1983, 422948

Int. Cl.³ E01H *5/04*

U.S. Cl. 37—234 **1 Claim**

1. A snowblower-equipped truck assembly comprising, in combination, a cab; a rear frame projecting rearward relative to the cab, and defining a usable platform behind the cab and a peripheral edge extending along the rear and the opposite sides of the rear frame; a snowblower unit including a housing, a snowblowing mechanism operatively rotatable in the housing and a motor connected to the snowblowing mechanism and operatively rotating the same; a post secured to the rear frame at the peripheral edge thereof and forming a vertically-extending slideway; a slide in vertical sliding engagement with the vertically-extending slideway; a pair of upright pivot elements are secured to the slide and cooperatively define a swivelling axis upwardly extending at the peripheral edge of the rear



frame; a pivot connection bracket is fixedly connected to the snowblower unit and pivotally connected to the upright pivot elements; a lifting hydraulic cylinder connected to the slide and constructed and arranged for selective lifting and lowering of the snowblower unit relative to the rear frame; and a swivelling hydraulic cylinder connected to the pivot connection bracket and constructed and arranged for selective swivelling of the snowblower unit between a lateral projecting position and a rearward projecting position relative to the rear frame.

4,480,398

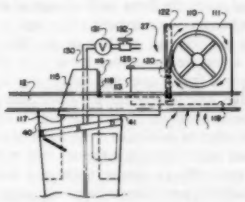
TROUSER PRESS WITH TROUSER INFLATOR AND WASTE HEAT RECLAIMER

Leonard Frushtick, Denver, N.C., assignor to Leonard Automatics, Inc., Denver, N.C.

Filed Sep. 16, 1983, Ser. No. 532,788

Int. Cl.³ D06F *71/28*

U.S. Cl. 38—42 **4 Claims**



1. In a trouser presser, including a frame, a stationary center buck mounted on the frame, side chests mounted on the frame on either side of the center buck and moveable between a retracted position in spaced-apart relation from the center buck and a pressing position against the center buck, with a front operator access opening forward of the center buck and a waist expander assembly mounted on the frame and alternately moveable between a dressing position forward of the center buck and a pressing position over the center buck, said waist expander assembly including a front waist buck and a rear waist buck adapted to receive the torso part of the pair of trousers, the improvement which comprises trouser inflating means for inflating the trousers with air when in the pressing position over the center buck to remove wrinkles from the trousers before pressing, said trouser inflating means comprising:

(a) an airblower stationarily mounted on said frame, said airblower having an air inlet and an air outlet;

(b) a damper positioned in the blower outlet for controlling the passage of air through said air outlet;

(c) duct means carried by and moving with said waist expander assembly and having an outlet for directing air past

said front and rear waist bucks, and a duct inlet for being moved into airflow communication with said blower outlet upon movement of said waist expander assembly into pressing position over the center buck, and out of airflow communication with said blower outlet upon movement of said waist expander towards the dressing position;

(d) a controller responsive to the presence of airflow communication between said blower outlet and said duct inlet for opening said damper to permit air to flow from the blower into said duct; and,

(e) heat reclaiming means for collecting waste heat from the side chests and directing the waste heat to said duct for being conveyed in a moving airstream through said duct into the trousers, wherein said heat reclaiming means comprises a shroud having a downwardly directed opening extending into the area above the side chests, said shroud communicating with said blower.

4,480,399

NAMEPLATE MANUFACTURING

Joseph A. Teti, Jr., Haverford, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.

Filed May 4, 1983, Ser. No. 491,606

Int. Cl.³ G09F 7/00

U.S. Cl. 40—584 **9 Claims**

1. A nameplate or the like comprising an open frame having a front face and a rear face thereof, said open frame having an opening extending completely therethrough, a peripheral recess in said front face resulting in an outermost surface and a shoulder spaced inwardly from said outermost surface, at least one insert member having a forward face and a rearward face with indicia in the form of a letter or the like being on said forward face, a tongue extending outwardly from said rearward face into said frame opening, said frame opening having a peripheral edge, said tongue having a peripheral side wall and a rear wall, spaced portions of said side wall contacting spaced portions of said edge to minimize movement of said insert upon insertion of said insert into said frame, said rear wall of said tongue being generally co-planar with said rear face of said frame, and an adhesive member adhesively secured across said rear wall and said rear face.

4,480,400

BOUNCING TOY

Jose E. diDonato, 3545 Island Rd., Wantagh, N.Y. 11793

Filed Jun. 13, 1983, Ser. No. 503,785

Int. Cl.³ A63H 3/31, 1/06

U.S. Cl. 446—188 **5 Claims**

1. A bouncing toy comprising;

(a) a base including stabilizing collapsible and distensible support means comprising spring members attached to the base to provide bounce and stability thereto,

(b) collapsible and distensible control means comprising a spring member attached to said base in proximity to the base support means having a first enclosure mounted thereon which includes therein helically oriented protruding means forming a part thereof,

(c) second enclosure means surrounding and in communication with said first enclosure and attached to said base and forming an integral part thereof,

(d) rotatable means including a helical shaft member carried by said second enclosure, the said shaft being disposed to impact said helically protruding means in said first enclosure to impart rotational movements to said rotatable means, and

(e) audio means in proximity to said base support means and coacting therewith for providing an audio indication of the bouncing movements of the toy.

4,480,401

RADIO-CONTROLLED CAR

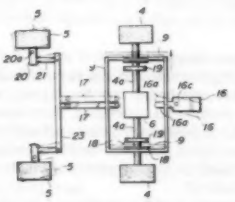
Yukimitsu Matsushiro, Tokyo, Japan, assignor to Kabushiki Kaisha Matsushiro, Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,896

Claims priority, application Japan, Dec. 15, 1983, 57-189425[U]

Int. Cl.³ A63H 00/00

U.S. Cl. 446—456 **8 Claims**



1. A radio-controlled car which is wirelessly controlled and capable of moving and turning in a wheelie running state, comprising:

a chassis;

a pair of drive axles mounted on said chassis which are connected to each other through a differential gear;

driving wheels one of which is fixed to each one of said pair of drive axles;

a servomotor mounted on said chassis which is actuated in response to a command signal transmitted from a control box for turning said car, while running, from the forward direction

a braking member movably mounted on said chassis which is moved by means including a linkage connecting it with said servomotor so as to control means moving with said drive axles to brake said driving wheel on the side of the car toward which turning is intended to repress the revolution thereof;

following wheels mounted on said chassis which are turned to the intended turning direction by means including a linkage connecting them with said braking member; and

an auxiliary wheel mounted on said chassis which is turned

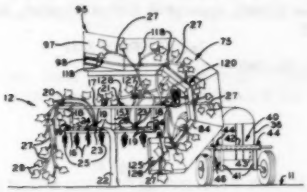
to correspond with the intended turning direction by means including a linkage connecting it with said braking member and rolls along the ground during only the wheelie running state.

4,480,402

METHOD AND APPARATUS FOR PLANT CULTURE

Kazuo Hiyama; Howard K. Hiyama, both of Fowler, and Dean H. Hiyama, Fresno, all of Calif., assignors to Hiyama Farms, Inc., Fowler, Calif.

Filed Sep. 9, 1981, Ser. No. 300,614
Int. Cl.³ A01B *39/28*
U.S. Cl. 47—1 R **13 Claims**



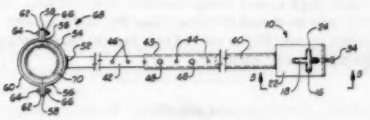
1. An apparatus for disposing pendant portions of plants in attitudes suited to a selected objective, the apparatus comprising a conveyor having a grasping section operable to introduce objects to the conveyor for transport therealong and a releasing section operable to release objects borne by the conveyor therefrom, said releasing section being spaced from said grasping section; and means for mounting said conveyor on a vehicle for transport along said plants with the grasping section deployed for contact with the pendant portions of the plants and the releasing section disposed above said plants to release said pendant portions for retention in attitudes rested on other portions of the plants.

4,480,403

APPARATUS FOR SUPPORTING A CANTILEVERED BEAM FROM A T-SHAPED POST

Wilburn R. Williams, R.R. 2, Atoka, Okla. 73425

Filed Jul. 28, 1983, Ser. No. 518,198
Int. Cl.³ A01G *17/06*
U.S. Cl. 47—42 **22 Claims**



1. A support apparatus for supporting a cantilevered beam from an upright post of substantially T-shaped cross section, said post having a transverse flange, a base flange perpendicularly extending from a center portion of a first side of said transverse flange, and a longitudinally spaced series of tangs protruding from a second side of said transverse flange opposite said first side, said support apparatus comprising:

a bracket including a pair of spaced horizontal plates having a cross-shaped aperture therein for vertically sliding registry with said upright post without interference with said tangs thereon, and a center plate facing said tangs joining said spaced plates along a first edge thereof, an end of said cantilevered beam being disposed between said spaced plates in contact with inwardly facing sides thereof and fixedly attached thereto adjacent a second edge of said spaced plates opposite said first edge; and

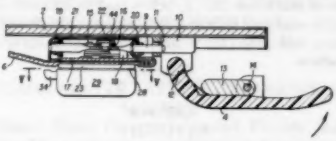
fastening means operatively associated with said bracket for bearing against said second side of said transverse flange of said post in spaced relationship to said tangs to rigidly locate said bracket in a variable position thereon.

4,480,404

LOCKING APPARATUS FOR A DETACHABLE SUNSHADE OF VEHICLES

Mikio Sato, Toyoake; Asao Ogasawara, Hekinan, and Keiji Mori, Toyota, all of Japan, assignors to Aisin Seki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 5, 1982, Ser. No. 355,307
Claims priority, application Japan, Mar. 17, 1981, 56-37095
Int. Cl.³ E05B *65/04*
U.S. Cl. 49—62 **19 Claims**



1. A locking apparatus for a detachable sunshade of a vehicle, comprising:

a detachable panel;

a connecting pin;

a sunshade detachably attached to an interior portion of said detachable panel and detachably engaged with said detachable panel at a rear portion thereof via said connecting pin;

a shaft supported on said sunshade;

an arm operatively connected to said connecting pin and to said shaft;

a locking handle pivotably supported on said sunshade and fixed to said shaft;

a knob movably mounted on said locking handle and being movable between a first position where said sunshade is engaged therewith so as to fix said locking handle against said sunshade and a second position where said sunshade is disengaged therewith so as to allow the rotation of said locking handle; and

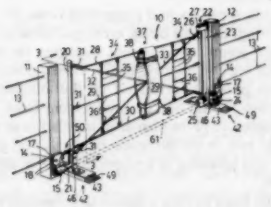
spring means for biasing said connecting pin in a direction for engagement with said detachable panel.

4,480,405

SELF-CLOSING GATE

Malcolm J. Ferguson, "Ross-Shire", Dayboro Rd., Samford Valley, Queensland 4502, Australia

PCT No. PCT/AU81/00161, § 371 Date Jun. 28, 1982, § 102(e) Date Jun. 28, 1982, PCT Pub. No. WO82/01734, PCT Pub. Date May 27, 1982
PCT Filed Nov. 12, 1981, Ser. No. 394,931
Claims priority, application Australia, Nov. 12, 1980, PE6448
Int. Cl.³ E06B *11/00*
U.S. Cl. 49—131 **7 Claims**



1. A self closing gate (10) of the type adapted to selectively

close a gateway between a pair of spaced gate posts (11,12), said gate being characterized by:

a pair of normally upright stiles (20,22) each having a laterally extending axle means (21,24);

a pair of gate support members (14) adapted to be fixed to said gate posts (11, 12), each axle means (21, 24) being rotatably journalled in a respective one of said support members (14);

tensioned flexible closure means (28–33) non-rigidly interconnecting said stiles to permit said gate (10) to be opened by swinging the same about a vertical axis through one of said stiles (20, 22) while such one stile has its axle means (21,24) journalled in an adjacent said support member (14); and

at least one counterweight means (42) connected to at least one of said stiles (20, 22) below said axle means (21, 24) to return said gate (10) to a normally upright closed position when said gate (10) is moved from said upright closed position.

4,480,406

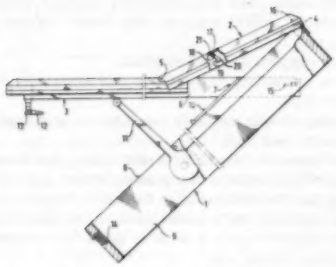
SKYLIGHT

Wilhelm Frank, Leinfelden, Fed. Rep. of Germany, assignor to Wilh. Frank GmbH, Leinfelden-Echterdingen, Fed. Rep. of Germany

Filed Aug. 11, 1982, Ser. No. 407,257

Int. Cl.³ E05D *15/48*

U.S. Cl. 49—153 **5 Claims**



1. A skylight comprising

(a) a case having lateral legs and an upper edge connecting the lateral legs, the lateral legs defining respective end faces,

(b) a wing having lateral struts adjacent the lateral legs of the case,

(c) an auxiliary frame supporting the wing on the case for pivoting between a closed and a swing position in relation to the end faces of the case,

(d) a swivel joint connecting the wing to the auxiliary frame,

(e) a hinged joint connecting the auxiliary frame to the upper edge of the case, the joints enabling the wing to be pivoted between the closed and swing positions,

(f) a locking device operative to position the wing in relation to the auxiliary frame and to lock the wing to the case in the closed position,

(g) pins fastened to, and projecting from, the lateral struts of the wing, the pins being arranged between the swivel and hinged joints, and the pins engaging the end faces of the lateral legs of the case in the closed position of the wing,

(h) flaps pivotally arranged on the auxiliary frame for engagement with, and disengagement from, the pins, and

(i) a respective pivot displaced in relation to a respective one of the pins in the direction of the swivel joint and permitting free pivoting of a respective one of the flaps about the pivot,

(1) the flaps having a detent at a free end remote from the pivots and a run-up ramp positioned on a respective one of the end faces of the lateral case legs in the closed position of the wing whereby the detents are out of engagement with the pins in said position, and the flaps freely pivoting when the auxiliary frame and the pins fastened thereto are lifted off the end faces whereby the detents of the flaps are coupled to the pins to permit the wing and auxiliary frame to be pivoted in unison into the swing position.

4,480,407

PET DOORS

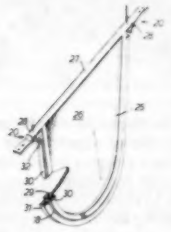
Robert J. Needham, 12 Grosvenor Rd., Chiswick, London W.4, and Philip T. Blenkinsop, 56 Chapel La., Fowlmere, Royston, Hartfordshire, both of England

Filed Aug. 12, 1982, Ser. No. 407,497

Claims priority, application United Kingdom, Aug. 26, 1981, 8125975

Int. Cl.³ E06B *7/32*

U.S. Cl. 49—168 **19 Claims**



1. A pet door comprising a frame, an inset flap received within said frame and being undersized with respect thereto, difining a gap therebetween, hinge means secured between a top portion of said flap and said frame permitting said flap to swing open for passage of a pet therethrough, and means for weather sealing said gap, said sealing means in part comprising two coacting magnetic members, one of said magnetic members being attached to an inner edge of said frame and confronting an edge of said flap and the other of said magnetic members being attached to said flap edge, at least one of said magnetic members being disposed for relative movement in a direction across said gap respectively into and out of face-to-face sealing contact with said other magnetic member upon movement of said flap into its closed positions and away therefrom, said hinge means being operable to lower said flap as it is moved into its closed position, whereby said magnetic member carried by said flap is moved into face-to-face contact with said other magnetic member.

4,480,408

SELF-STORING DOOR

Gerald J. Deuman, Sr., Rte. 1, 10283 Hwy. 54, Amherst, Wis. 54406, and Norman Sannes, Scandinavia, Wis., assignors to Gerald J. Deuman, Sr., Amherst, Wis.

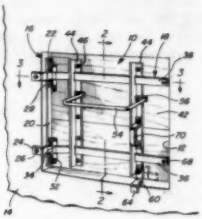
Filed Apr. 18, 1983, Ser. No. 486,302

Int. Cl.³ E05D *15/58*

U.S. Cl. 49—254 **8 Claims**

1. A silo door positionable in a closed position to close a vertical opening in the wall of a silo and in an open position enabling material to be unloaded from the silo through the opening, said silo door including a door panel of a dimension to fit closely within and close the opening in the silo wall to provide a flush interior surface to the door panel and silo, a hinge and slide assembly supporting the door panel for movement between a closed position and an open position with the hinge and slide assembly including a hinge structure enabling pivotal movement of the door panel about a generally vertical axis disposed radially outwardly of the inner surface of the silo and a slide assembly slidably supporting the door panel from

the hinge structure to enable the door panel to be slid horizontally laterally in relation to the vertical axis to enable the edge of the door panel adjacent the vertical axis to move away from



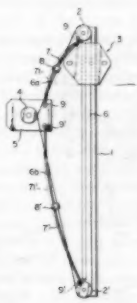
the vertical axis when moving toward open position and towards the vertical axis when moving toward the closed position.

4,480,409

WIRE-TYPE DOOR OR OTHER WINDOW REGULATOR FOR AN AUTOMOTIVE VEHICLE

Yoshiji Hara, Yokohama, Japan, assignor to Kabushiki Kaisha Johnan Seisakusho, Ueda, Japan

Filed Sep. 3, 1982, Ser. No. 414,611
Claims priority, application Japan, Apr. 30, 1982, 57-72828
Int. Cl.³ E05F 11/48
U.S. Cl. 49—352 **13 Claims**



1. Wire-type window regulator for a window which is useable for moving a window panel upward and downward which comprises:

a longitudinal guide rail having two opposed pulleys connected to the rail at correspondingly opposed longitudinally spaced apart points on the rail, and further having a bracket supported on the rail for reciprocal movement therealong intermediate said points, the bracket being adapted to support a window pane for corresponding movement relative to the rail;

a wire driving drum rotatably mounted on a baseplate,

a wire mounted on the drum and on the two pulleys for guided movement by the pulleys upon rotation of the drum and forming a wire circuit operatively interconnecting the base plate and rail, including one wire circuit portion extending between the two pulleys and along the rail and attached to the bracket, and further including another wire circuit portion extending between the two pulleys and operatively wrapped around the drum, permitting movement of the wire in a direction toward one of the pulleys and away from the other pulley according to the direction of rotation of the drum and correspondingly permitting movement of the bracket along the rail,

the rail and base plate being arranged in fixed relation to each other,

two opposed supporting and biasing elements correspondingly operatively interconnecting the baseplate and a corresponding portion of the rail adjacent a corresponding said pulley and arranged for correspondingly applying a biasing force in the direction of separating the base plate and the corresponding portion of the rail,

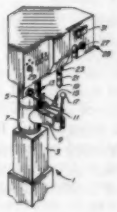
each of the supporting and biasing elements being provided with a wire slidably retainingly engaging means arranged thereon for operatively slidably retainingly engaging the wire at the correspondingly adjacent length thereof extending between the drum and the correspondingly adjacent pulley for correspondingly maintaining the wire portion thereat and, in turn, the wire circuit under biasing tension corresponding to said biasing force.

4,480,410

PRECISION CENTER LAPPING APPARATUS AND METHOD

Robbin Heimer, Mesa; Thomas C. Shepard, Phoenix, and Peter F. Lucier, Mesa, all of Ariz., assignors to Cen-T-Lap Corp., Phoenix, Ariz.

Filed Sep. 15, 1982, Ser. No. 418,280
Int. Cl.³ B24B 9/00
U.S. Cl. 51—5 D **3 Claims**



1. An improved center lapping machine comprising in combination:

(a) spindle means for supporting a rotary lapping element having an abrasive cone, said spindle means being movable along an axis of said abrasive cone to effect center lapping of a first center hole in a first end of a workpiece, said workpiece having a second end and a second center hole in said second end, and spindle rotating means for supporting said spindle means;

(b) variable speed motor means for applying variable speed rotary motion directly to said spindle means without necessitating changing drive belts in order to change spindle speed;

(c) stationary dead center cone means disposed in fixed aligned relationship to said abrasive cone for engaging said second center hole to effect accurate alignment of said workpiece with said abrasive cone during center lapping of said first center hole, an axis of said dead center cone means being colinear with said axis of said abrasive cone;

(d) a dressing stone element for precision dressing of said abrasive cone;

(e) dressing stone control means for precisely moving said dressing stone along a predetermined path in a fixed plane during a dressing operation to remove a thin layer of material from said dressing stone, and for moving said dressing stone away from said abrasive cone to a standby position, said axes of said abrasive cone and said dead center cone lying in said fixed plane, said dressing stone control means confining movement of said dressing stone element to said fixed plane both during said dressing operation and during movement of said dressing stone away from said conical abrasive stone element to said standby

position that permits positioning of said workpiece during a center lapping of said first and second center holes, said dressing stone control means including

(i) a stationary member having a first flat surface,

(ii) a pivotal member having a second flat surface,

(iii) pivot pin means for pivotally connecting said pivotal member to said stationary member, said second flat surface being in sliding relationship with said first flat surface during pivoting of said pivotal member, said first and second flat surfaces being parallel to said fixed plane,

wherein said pivotal member includes a movable pin, and said stationary member includes at least one hole in said first flat surface for receiving an end portion of said movable pin to precisely lock said pivotal member into a position that corresponds to a cone angle of said abrasive cone during a center lapping operation, wherein during a dressing operation said movable arm means moves in a direction that is precisely parallel to a straight line that lies entirely on the surface of said abrasive cone and also lies in said fixed plane, said dressing stone thereby also moving parallel to said straight line during that dressing operation,

wherein said movable pin is spring biased to continually urge said end portion into one of said holes in said first flat surface and includes a tee handle to facilitate manual pulling of said movable pin out of either of said holes in said first flat surface to permit pivoting of said pivotal member,

wherein said end portion of said movable pin is slightly tapered from an extreme end poriton that is slightly smaller than mouths of said holes in said first flat surface to another portion that is slightly larger than mouths of said holes in said first flat surface so that said end portion of said movable pin always fits very closely in said holes in said first flat surface despite any wear of said end portion or of walls of said holes in said first flat surface, thereby ensuring a long life during which precisely repeatable accuracy in dressing operation can be achieved,

(iv) first precision adjustment means for effecting precision adjustment of the position of said diamond to determine an amount of material to be removed from said conical abrasive lapping stone element during a dressing operation, and

(v) movable arm means connected in movable relationship to said pivotal member for supporting said precision adjustment means and confining movement of said diamond to said fixed plane during a dressing operation; and

(f) means for rigidly attaching said dressing stone control means directly to said spindle supporting means in order to prevent relative movement between said spindle and said dressing stone control means.

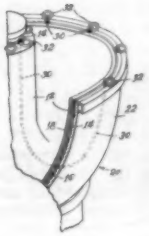
4,480,411

FINISHING CHAMBER WITH READILY-REMOVABLE LINING AND MEANS FOR ASSISTING WITH SAID REMOVAL, AND FINISHING MACHINE EMBODYING THE SAME

Gunther W. Balz, and Henry L. Upjohn, both of Kalamazoo, Mich., assignors to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Nov. 23, 1981, Ser. No. 324,129
Int. Cl.³ B24B *31/06*
U.S. Cl. 51—163.1 **9 Claims**

1. A chamber having an interior elastomeric lining suitable for use as the finishing chamber of a finishing machine or the like, comprising the said chamber, an interior elastomeric lining therefor, and interposed between the inner surface of said chamber and said lining a layer of thermally-activatable release agent in solid form, said thermally-activatable release agent being thermally activatable at a temperature below that temperature at which substantial deterioration of the said elastomeric lining occurs, said chamber comprising also lifting means in said interior lining or in said release agent layer for



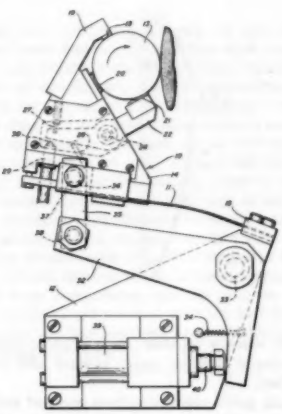
attachment of pulling means to assist with removal of said interior elastomeric lining from said chamber.

4,480,412

IN-PROCESS GRINDING GAGE

William E. Shank, and Kenneth K. Bercaw, both of Waynesboro, Pa., assignors to Litton Industrial Products, Inc., Waynesboro, Pa.

Filed Sep. 3, 1982, Ser. No. 414,845
Int. Cl.³ B24B *49/04*
U.S. Cl. 51—165 R **3 Claims**



1. An in-process grinding gage providing a means for continuously indicating the diameter of a cylindrical workpiece being ground comprising

gaging head means including

a body including fixed upper and center pads,

an arm pivotally secured to said body and including a lower pad,

arm spring means for urging said lower pad into engagement with the workpiece,

mounting bracket means,

leaf spring means secured at one end to said mounting bracket and having a free end,

said gaging head means secured to said free end of said leaf spring and positioned so that said upper and center pads engage the workpiece which is to be ground to size,

said leaf spring and said arm spring comprising means for continuously maintaining all three pads in contact with the workpiece as it is ground to size.

4,480,413

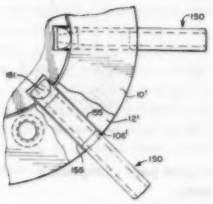
BLADED CENTRIFUGAL BLASTING WHEEL

Harold F. Schulte, Mishawaka; Raymond M. Leliaert, and Robert D. Rohr, both of South Bend, all of Ind., assignors to Wheelabrator-Frye Inc., Hampton, N.H.

Continuation-in-part of Ser. No. 316,749, Oct. 30, 1981, abandoned, which is a division of Ser. No. 78,478, Sep. 24, 1979, Pat. No. 4,333,278. This application Apr. 14, 1982, Ser. No. 368,420

Int. Cl.³ B24C 5/06

U.S. Cl. 51—435 6 Claims



1. For use in a centrifugal blasting wheel of the type including a pair of front and back wheel plates interconnected in spaced parallel relationship with each wheel plate having a central opening defined by an annular surface of constant diameter, wherein said plates are provided with respective cross-wise aligned grooves in their inner faces extending radially in equally circumferentially spaced relationship from the inner annular surfaces of the plates to the outer annular surfaces thereof and opening into each of said annular surfaces, a blade for each pair of said aligned grooves comprising, a body generally in the form of a parallelepiped having an inner and an outer end and side flanges to define a blade of I-shape in transverse cross-section, at least one retaining lug extending laterally from one of the side flanges and being substantially closer to the inner end of said blade body than the outer end thereof, said lug being provided with a curved, non-planer, smooth and uninterrupted abutment surface arranged to be in substantial co-extensive engagement with a portion of the inner annular surface of the adjacent wheel plate when the blade is operatively positioned between a pair of said grooves, thereby to minimize development of stress concentrations between the lug and the adjacent wheel plate, the radius of said abutment surface being coplanar with a radius of the opening defining said inner annular surface, the first-mentioned radius being less in length than the second-mentioned radius, whereby said abutment surface permits rocking of the blade so that radial forces only are transferred from the lug to the adjacent wheel plate.

4,480,414

BUILDING CONSTRUCTION

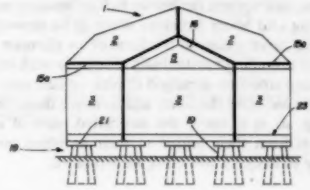
Donald B. Tschudy, 716 - 37th St., NW., Canton, Stark County, Ohio 44709, and Richard D. Tschudy, 225 Woodrow St., NW., North Canton, Stark County, Ohio 44720

Filed Sep. 24, 1982, Ser. No. 422,677

Int. Cl.³ E04B 7/00

U.S. Cl. 52—82 4 Claims

1. Hexagonal building construction comprising a primary hexagonal unit formed of a plurality of flat panel elements; the panel elements including a plurality of similar flat rectangular side wall panel elements formed with flat vertically extending edge members and top and bottom flat end members; the panel elements also including a plurality of similar flat side wall arch panel elements formed with flat vertically extending edge members, bottom flat end members, and top arch end members having flat end portions extending upwardly angularly toward each other from regions of upper ends of said vertically extending edge members and merging at a central peak; and the panel elements also including three similar flat roof panel elements formed with a central lower member having an outer edge and an inner angularly extending flat portion, with secondary flat edge members extending angularly upwardly from each end of said central roof panel lower member, and with an underface portion extending angularly inward from each said secondary edge member; and said secondary edge members having outer ends, and ridge edge members extending from said outer ends toward each other and merging at a top peak; the flat rectangular and arch side wall panel elements being alternately arranged in a hexagonal pattern; means directly joining adjacent flat vertically extending edge members of adjacent side wall panel elements together; means directly joining the central lower member inner angularly extending flat portion of a roof panel element means with the top flat end member of each rectangular side wall panel element; and means directly joining said underface portion extending from each secondary edge member of each roof panel element with a flat end portion of an arch end member of an adjacent arch side wall panel element.



4,480,415

EXTENDABLE STRUCTURES

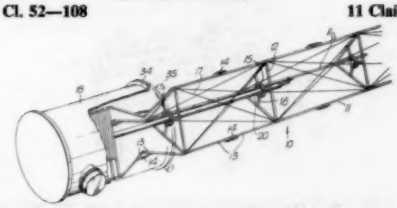
Peter Truss, Bristol, England, assignor to British Aerospace Public Limited Company, London, England

Filed Jun. 17, 1982, Ser. No. 389,488

Claims priority, application United Kingdom, Jun. 19, 1981, 8119040

Int. Cl.³ E04H 12/18

U.S. Cl. 52—108 11 Claims



11. In a spacecraft, a lightweight deployable open-frame boom system comprising an open-frame boom structure movable between a stowed compact condition and an elongate extended condition, said boom structure comprising:

a plurality of rigid polygonal frame members arranged in longitudinal registration, each frame member including at least three side elements connected end to end to define three corners;

at least three longeron elements, each connecting aligned corners of said frame members, the portion of each longeron element between adjacent frame members being defined by a pair of elongate elements, each pivotally attached at one end to a respective corner and at the other end to the other elongate member of said pair, for folding movement wholly in the plane defined by a side element adjacent said corner region and the corresponding side element of the adjacent frame member between a folded position in which said elongate elements lie in a side-by-side relationship between the corresponding side elements

without protruding beyond said polygonal frame members and an unfolded position in which said elongate elements lie in colinear relationship substantially normal to said side elements, each pair of elongate elements between adjacent frame members being foldable in an individual plane, and each pair being arranged so that when in the folded position, the elongate elements do not protrude beyond said corresponding side elements, and

locking means in the form of an over-centre spring arrangement associated with each pair of elongate elements adapted releasably to lock raid elements in their unfolded position, said system further including housing means for receiving said boom structure when in its stowed condition, and drive means in the form of an elongate flexible member extending substantially co-axially with respect to said boom structure arranged to pick up successive frame elements one after the other and to move them out of the housing, so as to move the associated pairs of elongate elements from their folded to their unfolded condition, thereby to define a stiff elongate structure.

4,480,416

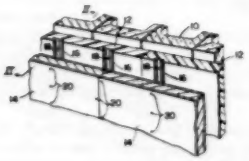
FASTENER STRIP FOR BUILDING WALL CONSTRUCTIONS

Thomas E. Judkins, 116 W. University Pkwy., Apt. 1002, Baltimore, Md. 21210, and Thomas J. Stanton, 9941 Oaklen Ct., Ellicott City, Md. 21043

Division of Ser. No. 187,708, Sep. 16, 1980, Pat. No. 4,366,692. This application Oct. 28, 1982, Ser. No. 437,462

Int. Cl.³ E04B *1/88, 2/28*

U.S. Cl. 52—376 **4 Claims**



1. In a wall construction comprising a concrete wall, a plurality of sheets of a plastic foam material in engagement with the wall, a plurality of covering panels in engagement with the sheets, and a plurality of fastener strips which are secured by nails or the like to the concrete wall so as to hold said foam sheets in place against the wall and through which are inserted a plurality of screws for securing said covering panels to said fastener strips, the improvement wherein said fastening strips each comprise an elongated relatively thin generally planar strip of metal, a plurality of strengthening ribs formed in and extending along the length of the strip, and a plurality of teeth formed in the body of the strip intermediate to the lateral edges thereof for securing the strip to a said foam sheet during installation of said construction, said plurality of strengthening ribs comprising first and second ribs formed at the longitudinal edges of the strip and third and fourth ribs formed intermediate said longitudinal edges of the strip, said teeth being disposed longitudinally of the strip in two rows, and said rows being located between the first and third ribs and the second and fourth ribs, respectively.

4,480,417

GLASS PANE FRAMED BY A U-SHAPED PROFILE RAIL

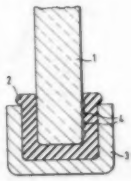
Manfred Evers, Mettmann, Fed. Rep. of Germany, assignor to Vereinigte Glaswerke GmbH, Aachen, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,144

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3030948

Int. Cl.³ E04F *15/14*

U.S. Cl. 52—400 **7 Claims**



1. A framed glass pane comprising:

(a) a glass pane;

(b) a frame press-fit on at least one marginal area of the glass pane, said frame comprising:

(1) a U-shaped profile rail, and

(2) an elastically resilient material disposed within the rail along the sides and bottom of the U-shaped profile for direct engagement with the marginal area of the glass pane to produce said press-fit; and

(c) a plurality of raised bodies on at least one surface of the glass pane within said marginal area, each of said bodies having:

(1) a height dimension sufficient to embed into the elastic resilient material when said frame is press-fit thereon to prevent relative sliding movement of the frame and glass pane in the direction of forces applied to the frame under normal operating conditions, and

(2) a substantially low and regular profile above the surface of said glass pane to permit initial relative sliding movement of the glass pane relative to the elastically resilient material during press-fitting of the frame onto the marginal area of the glass pane without destructive deformation of the resilient material.

4,480,418

MODULAR SYSTEM FOR SPACE GRID STRUCTURES

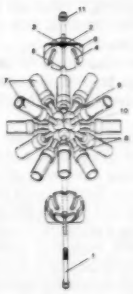
Ettore Ventrella, Corso Garibaldi 333, 80139 Napoli, Italy

Filed Mar. 29, 1982, Ser. No. 362,971

Claims priority, application European Pat. Off., Jul. 14, 1981, 81830116.0

Int. Cl.³ E04H *12/00*

U.S. Cl. 52—648 **5 Claims**



1. A modular system for use in fabricating space grid struc-

tures comprising a plurality of girders and a joint, each of said girders comprising a substantially spherical member fixedly mounted to an end thereof by a substantially cylindrical connecting portion of a given diameter, said joint comprising first and second substantially hemispherical hollow parts being adapted to be assembled to define a cavity into which one or more of said end members are substantially completely received, each of said parts having four substantially orthogonal substantially semi-circular openings and four substantially orthogonal elongated openings, said parts, when assembled, forming four substantially orthogonal substantially circular openings, each having a diameter substantially equal to said diameter and four substantially orthogonal elongated openings, each having a width substantially equal to said diameter and extending in a direction substantially parallel to the axis of said joint, said openings being adapted to accept said connecting portions therein, means extending through said cavity for connecting said part, said connecting means extending along said axis of said joint and structural rigidity enhancing members extending outwardly from said parts in a direction substantially coplanar with said axis.

4,480,419

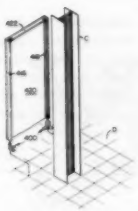
METHOD FOR ATTACHING FURRING ADJACENT TO COLUMNS

Robert C. Crites, P.O. Box 513, Euless, Tex. 76039

Filed Jun. 25, 1982, Ser. No. 392,317

Int. Cl.³ E04B *1/94*

U.S. Cl. 52—741 **29 Claims**



1. A method of attaching furring adjacent a structure comprising:

attaching a bracket to one face of a first sheet of furring,

slidably engaging a clip in said bracket,

positioning the sheet of furring, with the bracket engaging said clip, adjacent the structure,

selectively orienting said furring by moving said bracket relative to said clip, and

attaching said bracket to said clip to maintain the orientation of said furring.

4,480,420

DORMER STRUCTURE AND METHOD

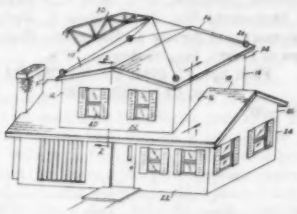
Sheldon Shacket, Southfield, and Robert Helfman, Franklin, both of Mich., assignors to Trus-Us, Inc., Royal Oak, Mich.

Division of Ser. No. 461,024, Jan. 26, 1983, Pat. No. 4,449,334. This application Feb. 14, 1984, Ser. No. 580,134

Int. Cl.³ E04G *21/00*

U.S. Cl. 52—745 **3 Claims**

1. The method of modifying a building structure having two parallel spaced apart bearing walls and a roof structure comprising cutting an opening in the roof structure between the bearing walls, separately constructing a dormer, lifting the dormer into position in the opening in the roof structure and



positioning it so that it bears on the bearing walls of the building structure.

4,480,421

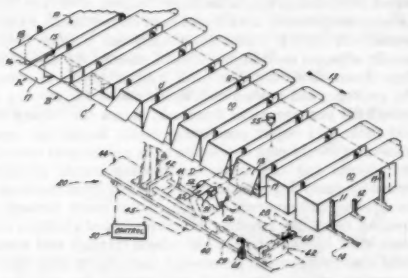
AUXILIARY FLAP SEALER FOR A CARTONING MACHINE

Wesley J. Rece, California, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Feb. 17, 1982, Ser. No. 349,528

Int. Cl.³ B65B *7/20, 57/02*

U.S. Cl. 53—75 **8 Claims**



1. In a cartoning machine having a continuously moving conveyor for carrying cartons having end flaps, a glue station wherein glue is applied to at least one carton end flap, and a plow downstream of said glue station to engage and press an end flap against other end flaps to seal the end of a carton as it is carried by said conveyor past said plow, the improvement comprising,

a mechanism for sealing at least one carton immediately upstream of said plow when said conveyor is stopped, said plow being the sole means to fold said flaps during the operation and during the stoppage of the conveyor, comprising,

a longitudinally movable support on which said plow is mounted,

a piston and cylinder connected to said support for moving said plow upstream, control means for sensing the stoppage of the conveyor and in response thereto for causing said piston and cylinder to move said support upstream to close said flaps to which glue is applied.

4,480,422

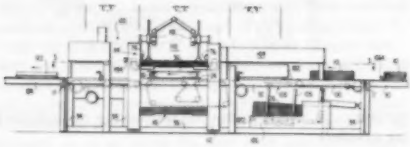
APPARATUS FOR PACKAGING STACKS OF SHEET MATERIAL

Otis E. Meives, Cleveland, Wis.; Larry L. Verhyen, deceased, late of Sheboygan, Wis. (by Kathleen L. Verhyen, special adzainistrator), and Jerome L. Hickmann, Sheboygan, Wis., assignors to Pemco, Inc., Sheboygan, Wis.

Filed Apr. 27, 1981, Ser. No. 258,173

Int. Cl.³ B65B *11/00*

U.S. Cl. 53—207 **54 Claims**



1. An apparatus for packaging objects of the type having a rectangular parallelepiped configuration with top, bottom, side and end surfaces, comprising a source of objects to be packaged; first conveying means for receiving a series of objects from said source and moving them along an essentially straight path; a source of bottom carton blanks for a package, each bottom carton blank having a plurality of foldable bottom flaps at the edges thereof for use in forming the bottom of a package, said source of bottom carton blanks comprising means for elevating and lowering a stack of bottom carton blanks beneath said path; means for positioning an object as it moves along said path at a position on a bottom carton blank which facilitates folding of the bottom flaps; means for stopping bottom carton blanks and the objects positioned thereon in positions for folding the bottom flaps; a source of top carton blanks for a package, each top carton blank having a plurality of foldable top flaps at the edges thereof for use in forming the top of a package; means for positioning a top carton blank on each object at a position which facilitates folding of the top flaps to form, in cooperation with the bottom carton blank, a package around the object; means for folding the bottom flaps upwardly adjacent each stopped object; means for folding the top flaps downwardly adjacent each stopped object to complete the package; and second conveying means for moving each completed package away from said means for folding along said path, said object positioning means having an opening transverse to said path in position to be passed over by each of the objects and said object positioning means comprising means for removing a bottom carton blank from the stack and for driving the removed bottom carton blank through said opening, means for arresting the movement of a bottom carton blank after its leading edge has moved through said opening, third conveying means for moving each object from said first conveying means along said path, means for arresting the movement of each object as it moves along said path so that the leading side of the object is positioned relative to the bottom carton blank to facilitate folding of bottom flaps on the leading edge of the bottom carton blank and fourth conveying means for moving the bottom carton blank and the object positioned thereon along said path upon release of said means for arresting movement.

11. An apparatus for packaging objects of the type having a rectangular parallelepiped configuration with top, bottom, side and end surfaces, comprising a source of objects to be packaged; first conveying means for receiving a series of objects from said source and for moving them along an essentially straight path; a source of bottom carton blanks for a package, each such bottom carton blank having a plurality of foldable bottom flaps at the edges thereof for use in forming the bottom of a package; means for positioning an object as it moves along said path at a position on a bottom carton blank which facilitates folding of the bottom flaps of such blank; means for stopping a bottom carton blank and an object positioned thereon in position for folding the bottom flaps; a source of top carton blanks for a package, each such top carton blank having a plurality of foldable top flaps at the edges thereof for use in forming the top of a package; means for folding bottom flaps upwardly adjacent each stopped object; means for positioning a top carton blank on each object at a position which facilitates folding of top flaps to form, in cooperation with a bottom carton blank, a package around the object, comprising support rail means extending transverse to said path above said means for folding bottom flaps, a top carton blank positioning carriage mounted for movement on said support rail means, vacuum cups, vacuum cup lifting means mounted on said positioning carriage for upward and downward movement with said vacuum cups, means for raising and lowering said lifting means and means for moving said positioning carriage transversely to said path in order to transfer, by means of said vacuum cups, a top carton blank from said source of top carton blanks, to position a top carton blank on each object and to return to said source of top carton blanks; means for folding top flaps downward adjacent each stopped object to complete the package; and second conveying means for moving each completed package away from said means for folding and along said path.

4,480,423

ARRANGEMENT FOR UNLOADING AND LOADING X-RAY FILM CASSETTES

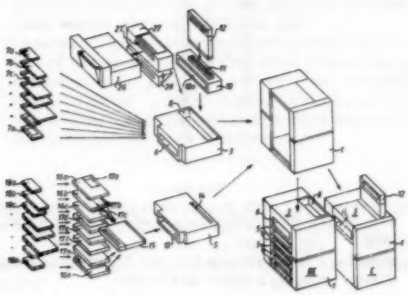
Jürgen Müller, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 384,163

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122583

Int. Cl.³ B65G *65/04;* **B65B** *43/38*

U.S. Cl. 53—266 R **10 Claims**



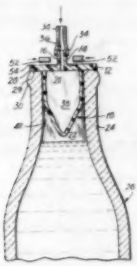
1. An arrangement for unloading and loading cassettes, especially X-ray film cassettes, comprising a frame-shaped support; a cassette-handling station mounted on said support and including a housing defining an internal chamber for receiving the respective cassette, and means for light-tightly handling the respective cassette in said internal chamber, including means for unloading and loading the cassette; a plurality of storage receptacle mounting portions of identical configurations supported in said frame-shaped support and having respective channels of identical dimensions; a plurality of storage receptacles having identical external dimensions compatible with those of said channels for accommodation therein and each including means for bounding a recess dimensioned to fittingly receive a stack of films of a size selected from a plurality of different sizes; means for transporting the individual films from the respective storage receptacles to said handling station for loading into the respective cassettes; and means for conveying the films unloaded from the respective cassettes out of said handling station.

4,480,424

BOTTLE SEALING APPARATUS AND METHOD

Philip Seldon, 370 E. 76th St., New York, N.Y. 10021

Filed Nov. 9, 1981, Ser. No. 319,642
Int. Cl.³ B67B *1/04, 1/08;* B65B *7/28*
U.S. Cl. 53—489 **22 Claims**



1. Apparatus for sealing the neck of a bottle, said neck being of a predetermined diameter, comprising

a disc member, and

an inflatable member,

said inflatable member being made of a flexible but inelastic material and being sized so as to be of greater diameter than said predetermined diameter when fully inflated,

means for securing said inflatable member with respect to the underside of said disc member,

said disc member being adapted for placement upon the lip of said bottle neck,

said inflatable member being adapted for insertion within the neck of said bottle,

inflation means operatively associated with said inflatable member to permit the introduction of pressurized fluid into said inflatable member, whereby expansion of said inflatable member causes the same to conform to the configuration of the interior portion of said bottle neck and to form an hermetic seal therein, and

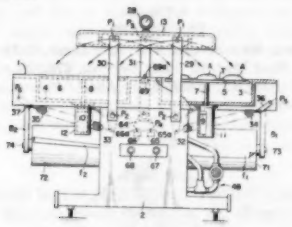
means for sealing said inflation means after expansion of said inflatable member.

4,480,425

VACUUM PACKAGING APPARATUS

Takao Furukawa, Onomichi, Japan, assignor to Kabushiki Kaisha Furukawa Seisakusho, Tokyo, Japan

Filed Jan. 8, 1982, Ser. No. 338,448
Claims priority, application Japan, Jan. 16, 1981, 56-5770
Int. Cl.³ B65B *11/52*
U.S. Cl. 53—509 **6 Claims**



1. A vacuum packaging apparatus comprising:

a base box having first and second recessed lower chambers with open tops in side-by-side arrangement with a specific space therebetween;

an upper head having a recessed upper chamber with an open bottom adapted to be manually transferable alternately from atop one lower chamber to atop the other thereby to bring the upper chamber into airtight register alternately with the lower chambers to form alternately two vacuum chambers between which upper and lower chambers upper sheets of packaging material are placed, said upper head having, at its open bottom, a heating plate provided with a plurality of openings connecting the upper and lower chambers with each other when the upper head is placed over either of the lower chambers, and functioning to soften each sheet of upper packaging material for packaging the articles, said upper head being supported on the base box by a plurality of pivotable parallel links each having a neutral vertical position between said two lower chambers when said upper chamber is spaced from said lower chambers, at least two of which are respectively connected to two springs held on the base box for urging respective links to rotate in opposite directions to each other, each spring having idling means (36 oside, each link moves, stretching its respective spring;

a vertical movable table disposed in each of the lower chambers and adapted to support thereon packaging material and articles to be packaged;

a vacuum-operated cylinder for vertically moving each of the tables; and

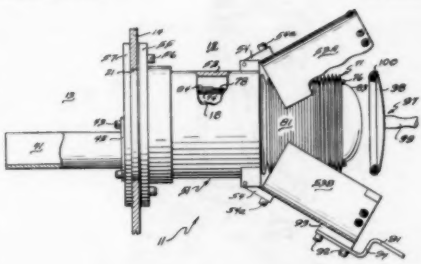
a vacuum control system for controlling the air pressures in the vacuum chambers and the vacuum-operated cylinders in accordance with movements of the upper head and the parallel links, said vacuum control system operating the vacuum cylinders in such a manner that the vertical movable table is raised when said links are in said specific range of said neutral position and when the articles are put thereon and is lowered before the upper packaging material is heated by the heating plate after the upper head is placed over either of the lower chambers.

4,480,426

MATERIAL BAGGING DEVICE

Charles G. Wach, Oak Lawn; Robert E. Nelson, Lombard, and Stephen B. Brak, Tinley Park, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 19, 1982, Ser. No. 340,625
Int. Cl.³ B65B *43/42*
U.S. Cl. 53—576 **15 Claims**



1. A bagging device for remotely transferring material from a first contaminated chamber through an opening in a wall to a second clean chamber, said bagging device comprising:

a housing attached to said wall in communicating alignment with said opening and extending into said second clean chamber, said housing having an open proximal and a closed distal end relative to said wall;

an open-ended cartridge positioned within and in close proximity to said housing, said cartridge having proximal and distal ends corresponding to those of said housing and inner and outer surfaces;

a flexible tube sealably positioned on the inner and outer surfaces of said cartridge and including:

a closed end positioned adjacent and in sealing relation to the distal end of said cartridge; and

an extendible portion coupled to said closed end and slidably positioned on the outer, distal portion of said cartridge in sealed relation thereto;

said tube adapted to receive material from said first contaminated chamber through said opening in said wall and to be extendibly displaced from the distal portion of said cartridge in response to the further displacement of said material against the closed end of said tube wherein a proximal portion of said tube may be sealably severed in securing said material in said closed tube while providing another closed end portion of tube in said cartridge for receiving additional material without subjecting said second clean chamber to the contamination of said first chamber; and

sealing means interposed in sealed engagement between said housing and said cartridge and extending around the inner circumference of said housing and sealably engaging said cartridge in permitting movement of said cartridge towards said first chamber but resisting movement of said cartridge towards said second chamber in allowing a tube depleted cartridge to be discharged into said first chamber while resisting the withdrawal of said cartridge into said second chamber when material is being deposited in said tube.

4,480,427

NOSE BAND

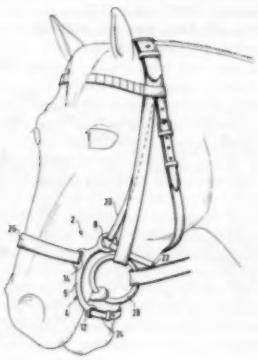
Ulrich Conrad, Worpswede, Fed. Rep. of Germany, assignor to Kannemeier & Koch GmbH, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,624

Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217597

Int. Cl.[3] **B68B** *1/04*

U.S. Cl. 54—6 R **2 Claims**



1. A nose band including a nose band bow having a longitudinal bow body, a head piece, a nose strap, and two chin straps, said head piece and one of said chin straps being connected to an upper eyelet at one end of said bow, said other chin strap being connected to a lower eyelet at the lower end of the bow, and said nose strap being connected to another eyelet located between the ends of the nose band bow just below said upper eyelet, characterized in that the body of the nose band bow is crecent-shaped and has its upper and lower ends bent backwardly and laterally away from the horse's head when the nose band is strapped, the curvature and the location of the bow body in the strapped position party surrounding, in spaced relationship, a bit and a bit ring of a bridle.

4,480,428

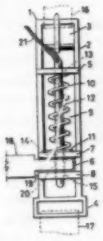
SHAFT COUPLER

Gordon E. Gilbertson, P.O. Box 21, Morpeth, Ontario, Canada

Filed Sep. 1, 1983, Ser. No. 528,643

Int. Cl.[3] **B68B** *5/08;* **B62C** *5/00*

U.S. Cl. 54—69 **2 Claims**



1. A device for rapidly attaching and releasing the shafts of a horse-drawn vehicle, to and from the harness of the horse, primarily in connection with harness horse racing, comprising a spring loaded device having an elongated rectangular main frame; the upper part of said frame consisting of a buckle arrangement by means of which the said device is attached to a backband of the harness; the lower part of the device being provided with a loop for attachment of a harness connecting strap; a small rectangular plate just below the buckle arrangement and extending from the main frame and at right angles to it, having a hole in it for the passage therethrough of a latch pin; a clevis formed by two spaced, small, parallel plates extending at right angles from the main frame, and located just above the said bottom loop, for inserting the free end of a sulky shaft therein, with the free end not extending beyond the clevis and being reduced in size relative to the remainder of the shaft; a hole in each of the clevis plates for the passage therethrough of said latch pin; said latch pin comprising a metal spring-loaded rod which passes through said latch pin holes in the top extension plate and the clevis plates; a spring surrounding the latch pin, in compression, between the upper extension plate and a washer which is permanently attached to the latch pin, said pin being long enough to extend above the upper plate extension, and below said clevis in its locked position; and a rope or cable attached to the upper end of said pin by means of which the pin can be pulled upwardly to release the shaft held in said clevis; said shaft having a hole in its free end for the passage of said latch pin therethrough.

4,480,429

FLY GUARD

Gayle B. Knox, 5661 Peridot Ave., Alta Loma, Calif. 91701

Filed Mar. 18, 1983, Ser. No. 476,590

Int. Cl.[3] **B68C** *5/00;* **A61F** *9/02*

U.S. Cl. 54—80 **2 Claims**

1. A fly guard for a horse, comprising

a headdress having eye holes and including annular pockets about each said eye hole;

resilient toroidal inserts sized to fit in compression in said annular pockets;

screen caps extending over each said resilient toroidal insert and having a substantially planar screen section and a ring section extending about the periphery of said screen section, said ring section including an inwardly facing channel for receipt of said resilient toroidal insert.

4,480,430

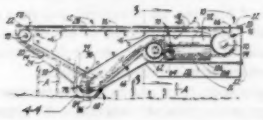
ASPARAGUS PICKING MACHINE

Stephen L. Wahls, R.R. 1, Mitchellville, Iowa 50169

Filed Dec. 8, 1982, Ser. No. 447,982

Int. Cl.³ A01D *45/00*

U.S. Cl. 56—327 A **10 Claims**



1. An asparagus picking machine for picking a plurality of asparagus sprouts, each of which is extending upwardly from the ground, said sprouts differing in height and diameters from one to another, said machine comprising:

a frame assembly;

mounting means for mounting said frame assembly to a vehicle;

at least a forward sprocket means and a rearward sprocket means mounted to said frame assembly for rotation about a forward horizontal axis and a rearward horizontal axis respectively, each axis being transverse to the direction of travel of said machine;

a continuous picker belt assembly comprising a plurality of elongated spaced apart parallel picker bars extending parallel to said rotational forward and rearward axes of said sprocket means, said belt assembly further comprising chain means interconnecting said spaced apart picker bars;

chain guide means connected to said frame assembly in a position spaced below and rearwardly from said forward sprocket means, said guide means being adapted to receive said chain means and cause said chain means to travel in an S-shaped pattern at a point below and rearward from said forward sprocket means;

said chain means being trained around said forward and rearward sprocket means and being guided through said guide means so as to travel in a downward and rearward inclined path from said forward sprocket to said guide means and thence through an S-shaped pattern as said chain means passes through said guide means whereby said sprouts extending upwardly between said picker bars are snapped off thereby; and

power means for causing said picker belt assembly to move continuously around said forward sprocket means, said chain guide means, and said rearward sprocket means.

4,480,431

RAKE WITH TINE REINFORCING CHAIN

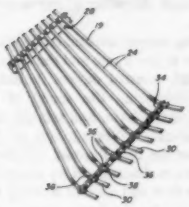
Albert L. Beaudoin, South Burlington, Vt., assignor to Roger C. Blanchard, South Burlington, Vt.

Filed Jul. 12, 1983, Ser. No. 513,002

Int. Cl.³ A01D *77/00*

U.S. Cl. 56—400.17 **3 Claims**

1. A rake including an elongated handle having first and second ends, a generally fan-type multi-tine head supported from said first end and projecting outwardly therefrom, said tine head including a plurality of elongated tines anchored relative to each other and said first end at one set of corresponding ends thereof and with said tines diverging outwardly toward the other set of corresponding ends thereof with said other ends being disposed, generally, in the same plane, said other ends including similar laterally directed terminal ends disposed transverse to said plane, elongated transverse connecting and bracing means extending between and interconnecting said tines centrally intermediate sa d terminal ends and said one set of corresponding ends, and debris movement limiting means connected between adjacent terminal end portions and spaced from the free ends thereof interconnecting



adjacent terminal end portions for limited lateral shifting, only, relative to each other and preventing movement of debris impaled by said free ends upwardly along said tine terminal end portions past said debris movement limiting means, said debris movement limiting means including a link chain section extending transversely of said terminal end portions, selected links of said link chain section being anchored relative to said terminal end portions, at least one link of said link chain section being disposed between each pair of adjacent selected links of said link chain section anchored relative to said terminal end portions.

4,480,432

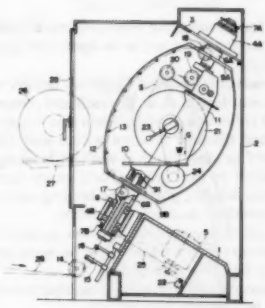
INCLINED VERTICAL TYPE STRANDING MACHINE

Tokuji Yoshida, Tokyo, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1982, Ser. No. 444,926

Int. Cl.³ D07B *3/10*

U.S. Cl. 57—58.65 **4 Claims**



1. A stranding machine for twisting wire elements and winding the twisted wire elements onto a bobbin, comprising

a frame,

upper and lower bearings connected to the frame, said upper and lower bearings being arranged coaxially in an imaginary line inclined at an angle from 10 to 60 degrees relative to the vertical line of the frame,

a flyer having upper and lower hollow flyer shafts rotationally situated in the upper and lower bearings, and at least one flyer arm in the form of a bow for connecting the upper and lower flyer shafts,

a floating mechanism having a floating frame freely rotationally supported by the upper and lower flyer shafts to be located substantially along the inclined imaginary line, means for rotationally supporting the bobbin situated on the floating frame, and first driving means for rotating the bobbin held by the bobbin supporting means, the wire elements to be twisted being conducted from outside through one of the upper and lower hollow flyer shafts and then extending to the other of the upper and lower hollow flyer shafts along the flyer arm and finally being connected to the bobbin on the floating mechanism by passing through the other of the upper and lower hollow flyer shafts,

a second driving means situated on the frame for rotating the flyer relative to the frame and the floating mechanism, and

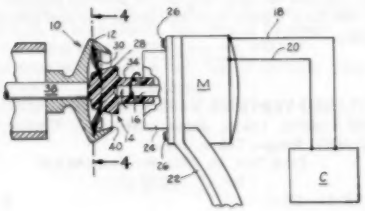
a constant pitch control device including first measuring means for measuring the speed of the wire elements wound onto the bobbin, and second measuring means for counting the rate of revolution of the second driving means so that the twisting rate relative to a length of the wire elements is determined by controlling the rotational speed of the first and second driving means based on the values obtained by the first and second measuring means.

4,480,433

ROTOR CLEANING

Richard N. Ryer, II, Cleveland, S.C., assignor to Platt Saco Lowell Corporation, Greenville, S.C.

Filed Feb. 25, 1983, Ser. No. 469,877
Int. Cl.³ D01H *7/885*
U.S. Cl. 57—302 **9 Claims**



1. Apparatus for cleaning the fiber collection groove in the cup of a yarn spinning rotor use in an open end spinning machine, comprising:

a. cleaning means comprising a resiliently flexible end member of sufficient length so as to reach and overextend the apex of said collection groove, when said means is set at a predetermined distance position within said rotor's cup, such that said member flexes in resilient bending when its tip is contained by said groove, said means further comprising a body holding portion for holding said end member in an extended condition therefrom;

b. means for providing relative rotation, counter rotation, and changeovers in rotational sense between said rotor's cup and said flexible end member;

c. means for moving said flexible end member into and out of said rotor's cup; and

d. control means

for establishing a predetermined sequence of movements, changes of movements, and stoppages of movements of said rotor's cup and said flexible end member, and

for controlling said movements, changes of movements and stoppages of movements in accordance with said established and predetermined sequence

to effect said cleaning means to clean said collection groove, said control means being interconnected with said means for providing and said means for moving.

9. A process for cleaning the fiber collection groove in a cup of a yarn spinning rotor used in an open end spinning machine, employing the apparatus as defined in claim 1, comprising the steps of

a. moving the cleaning means of said apparatus into said cup and fixing one so that it does not move after attaining a predetermined position of one relative the other such that the resiliently flexible end member reaches and overextends to the apex of said groove, and its tip is contained by said groove such that it flexes in resilient bending;

b. effecting relative rotation of said end member with said cup a prescribed number of degrees, then counter rotating the one relative the other in an opposite rotational sense a different prescribed number of degrees, whereby upon the changeover from rotation to relative counter rotation, the flexible end member while in rotation moving along said groove with said tip directed away from the direction of rotation and the felxible member resiliently bent in the direction of rotation, both the direction of the tip and the direction of bending are reversed, and then again after a prescribed number of degrees of counterrotation are attained causing another changeover from counter rotation to rotation to form one cycle of events;

c. repeating said cycle of events a predetermined number of times as experience shows will effect the cleaning desired; and

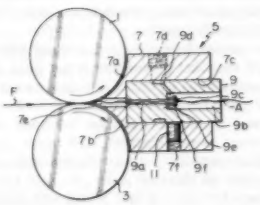
d. moving said cleaning means out of said cup.

4,480,434

AIR NOZZLE FOR PROCESSING A FIBER BUNDLE

Niimi Hiroshi, Nagoya; Anahara Meiji, Kariya, and Muramatsu Shigeru, Okazaki, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kabushiki Kaisha Toyota ChuoKenkyuscho, both of Aichi, Japan

Filed Sep. 30, 1982, Ser. No. 430,512
Claims priority, application Japan, Oct. 7, 1981, 56-158623
Int. Cl.³ D02G *1/16*
U.S. Cl. 57—333 **6 Claims**

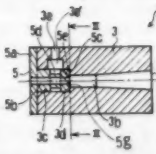


1. An air nozzle for processing a fiber bundle comprising a body having a narrow channel and a wide channel in series to form a yarn passage, each having an inner and outer end, and at least one jet opening on an inner wall of said wide channel, said air nozzle being characterized in that the inner end of said narrow channel protrudes from the inner end of said wide channel into the interior of said wide channel, and said jet is inclined to an axis of said wide channel toward the outer end of said wide channel and opens in the vicinity of said inner end of said narrow channel, said wide channel having a circular cross-section, the diameter of said circular cross-section of said wide channel along its length being at least as large as the diameter at its inner end.

4,480,435
FALSE-TWIST NOZZLE

Meiji Anahara, Kariya; Yoshihisa Suzuki, Chiryu; Shigeru Takasu, Kariya, and Hiroshi Omori, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 23, 1982, Ser. No. 452,723
Claims priority, application Japan, Dec. 25, 1981, 56-209050
Int. Cl.³ D02G 1/16; D01H 1/12
U.S. Cl. 57—333 **12 Claims**



1. A false-twist nozzle for producing a spun yarn from yarn fibers, said nozzle having a body including an imaginary longitudinal central axis, an outer surface, an upstream end and a downstream end, and comprising means defining a yarn passage hole extending along said longitudinal axis between said ends for passage of said yarn fibers through said body, said yarn passage hole means comprising means defining a small hole portion thereof extending inwardly from said upstream end to an interior location within said body, a larger hole portion thereof conjoining with said small hole portion and extending from said interior location towards said downstream end, and a downstream-facing interior surface of said body substantially surrounding said small hole portion at said interior location; means defining a yarn-spinning fluid conduit of said body including a discharge end thereof at a location on said interior surface which is laterally spaced from said small hole portion and adjacent to the periphery of said larger hole portion, at least the length portion of said fluid conduit which is adjacent to its said discharge end being angularly disposed with respect to said longitudinal axis of said body for introducing yarn-spinning fluid into said larger hole portion in a direction which is both downstream and annular within said larger hole portion; and means defining a second yarn-spinning fluid conduit of said body including a discharge end thereof at a location on said interior surface which is laterally spaced from said small hole portion on the side thereof which is opposite to said location of the discharge end of the first said yarn-spinning fluid conduit, and adjacent to the periphery of said larger hole portion, at least the length portion of said second fluid conduit which is adjacent to its said discharge end being angularly disposed with respect to said longitudinal axis of said body for introducing additional yarn-spinning fluid into said larger hole portion in a direction which is downstream and annular within said larger hole portion to augment the flow of said yarn-spinning fluid introduced through the first said fluid conduit.

4,480,436
COMBUSTION CHAMBER CONSTRUCTION

Harvey M. Maclin, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 19, 1972, Ser. No. 316,531
Int. Cl.³ F02C 7/20
U.S. Cl. 60—39.32 **2 Claims**

1. A combustion chamber for use in gas turbine engines, the chamber comprising:

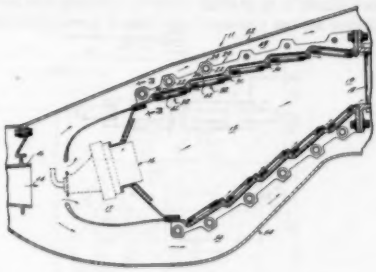
an inlet for receiving air and fuel to be burned;

an outlet for expelling products of combustion;

high strength structural frame means disposed between the inlet and the outlet for supporting mechanical forces associated with the chamber; and

liner means disposed within the frame,

said liner means including a plurality of circumferentially adjacent panels of high temperature material, at least one of said panels having grooves in two axially facing opposed edges and further having a pair of circumferentially facing edges, said frame means including a plurality of pairs of spaced, opposed flanges, each flange of at least one of said pairs of flanges including a tongue protrusion

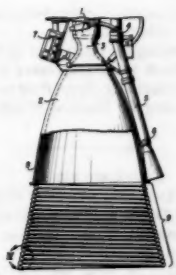


for cooperation with one of said grooves to slideably retain said panels between said pair of flanges, said pair of circumferentially facing edges on said one of said panels cooperating in a tongue and groove relationship with circumferentially facing edges on other of said circumferentially adjacent panels.

4,480,437
UNFOLDABLE DEVICE FOR EXTENDING THE NOZZLE OF A ROCKET ENGINE

Paul D. Gauge, Cesson, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Mar. 10, 1983, Ser. No. 474,060
Claims priority, application France, Mar. 17, 1982, 82 04508
Int. Cl.³ F02K 9/97
U.S. Cl. 60—271 **6 Claims**



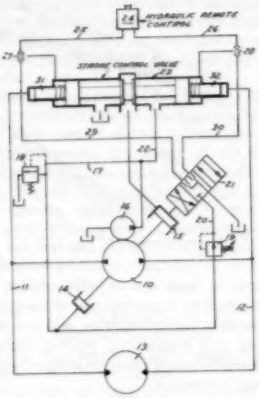
1. An unfoldable device for extending the nozzle of a rocket engine, intended especially for equipping the intermediate stages of a launcher, which consists of a frustoconical skirt formed by a stack of tube rings or coils welded to one another, the said tube rings or coils having a cross-section flattened in the direction of the stack, and of a pyrotechnic device accommodated in the tube and capable of generating, when ignited, sufficient pressure to increase the dimension of the tube in the direction of the stack.

4,480,438

POWER TRANSMISSION

Robert H. Breeden, Metamora, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Jan. 20, 1982, Ser. No. 340,980
Int. Cl.³ F16H *39/46*
U.S. Cl. 60—389 **7 Claims**



1. A hydraulic system comprising
a reversible variable displacement pump,
hydraulic servo motor means for controlling the direction and amount of displacement of said pump,
a fluid motor connected in parallel to said pump and adapted to be driven by said pump,
a pilot pressure operated directional valve functioning as a stroke control valve for controlling the position and direction of said servo motor system,
and means for sensing the displacement of said pump and applying a force to said directional valve opposite to the force of the pilot pressure for moving said valve,
said servo motor means being of the differential area type comprising a small area piston and cylinder and a large area piston and cylinder,
an auxiliary pump,
said small area piston being connected to the output of said auxiliary pump,
said output of said auxiliary pump being also supplied to said stroke control valve,
said means for sensing the position of said servo motor comprising a feedback valve responsive to the displacement thereof and connected to direct fluid to said stroke control valve for opposing the direction of movement due to pilot pressure.

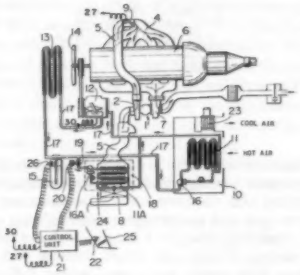
4,480,439

SUPPLY-AIR COOLING SYSTEM FOR AN ENGINE INCLUDING A TURBOCHARGER

Ken Yamane, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Dec. 29, 1981, Ser. No. 335,336
Claims priority, application Japan, Jan. 16, 1981, 56-4677[U]
Int. Cl.³ F02B *37/00;* **F25B** *27/00*
U.S. Cl. 60—599 **3 Claims**

1. A supply-air cooling system for an engine having a turbocharger for operating an air-supply blower connected to a turbine driven by exhaust gas for forcibly supplying air to the engine through an intake duct, which comprises:
(a) a first cooling fin means for cooling the supply air introduced into the engine, said cooling fin means being disposed upstream from the air-supply blower;
(b) a second cooling fin means for cooling a passenger compartment, said second cooling fin means being connected in parallel with said first cooling fin means;
(c) a compressor for compressing the refrigerant evaporated within said first and second cooling fin means after having absorbed heat therethrough.
(d) a condenser for liquefying the refrigerant compressed by said compresser;
(e) a liquid tank for temporarily storing the refrigerant liquefied in said condenser;
(f) first and second throttles connected between said liquid tank and said first cooling fin means and between said liquid tank and said second cooling fin means, respectively, for gasifying the refrigerant stored in said liquid tank;



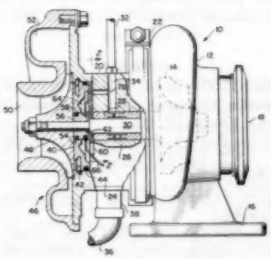
(g) an electromagnetic valve for opening and closing a duct disposed between said liquid tank and said first throttle;
(h) a throttle switch actuated when an accelerator pedal is depressed beyond a predetermined point, thereby detecting a degree of engine load; and
(i) a control unit for outputting a signal to said electromagnetic valve to open said valve when said throttle switch detects that engine load is heavy,
whereby the supply-air cooling system is used in common with the passenger compartment cooling system when engine load rises beyond a predetermined value.

4,480,440

TURBOCHARGER COMPRESSOR END VENTILATION SYSTEM

Allan C. Harper, Indianapolis; Edwin L. Jones, New Palestine, and Ivan D. Beaver, Indianapolis, all of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Apr. 21, 1982, Ser. No. 370,407
Int. Cl.³ F02B *37/04*
U.S. Cl. 60—605 **12 Claims**



12. A turbocharger for internal combustion engines, said turbocharger being of the type including a bearing housing having a lubricant drain cavity an a bearing support projecting into said lubricant drain cavity, a lubricant supply line for

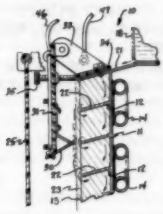
directing lubricant into said bearing support and a drain line for draining lubricant from said lubricant drain cavity into an engine crankcase, an insert closing one end of said bearing housing, a shaft rotatably journalled in said bearing support and extending through said insert, a thrust bearing abutting one end of said bearing support, a compressor wheel carried by said shaft on the side of said insert remote from said thrust bearing, the improvement comprising said insert together with said thrust bearing defining a lubricant collection area, and passage means for venting engine crankcase gases through and adjacent said thrust bearing for venting to said lubricant collection area from said lubricant drain area, whereby under vacuum conditions in the compressor, crankcase gases are drawn through said passage means into said lubricant collection area for venting said lubricant collection area and flow of lubricant from the bearing housing into the compressor is inhibited.

4,480,441

ICE MAKER HARVEST CONTROL

Carl J. Schulze-Berge, and Vance L. Kohl, both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Jan. 26, 1983, Ser. No. 461,122
Int. Cl.³ F25C *1/12*
U.S. Cl. 62—138 **4 Claims**



1. In an ice making machine having a freezing mold with cells and an open face, a pump for delivering a water stream into said mold, a refrigeration system for chilling said mold, and an electrical control for stopping said pump and causing said refrigeration system to heat rather than chill said mold, an ice harvest sensor comprising, in combination, an electrically conducting probe mounted on a non-electrically conducting support with the probe being slightly spaced from said mold open face and being free to move well clear of the mold face, means for adjusting the spacing of said probe from said open face, means for electrically coupling said control with the water stream delivered into said mold, and means for coupling said control with said probe so that contact between the probe and the water stream delivered into the mold completes a circuit causing said control to stop said pump and heat the mold so as to harvest ice.

4,480,442

AIR CONDITIONING SYSTEM

Yuichi Ide; Yasutoshi Tsuchiya, both of Fuji, and Yoshihito Mino, Shizuoka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 16, 1984, Ser. No. 571,061
Claims priority, application Japan, Jan. 17, 1983, 58-5663
Int. Cl.³ F25B *7/00*; F24F *3/00*
U.S. Cl. 62—175 **5 Claims**

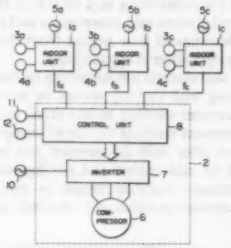
1. An air conditioning system comprising:

a capacity-variable outdoor unit in which a compressor is driven by the power supplied from a variable-frequency power supply;

a plurality of indoor units which are supplied with a refrigerant from said outdoor unit so as to control room temperature;

each of said plurality of indoor units having a frequency signal circuit which generates a frequency signal to be applied to said outdoor unit depending on the difference between a set temperature and a temperature detected by a room temperature sensor means; and

said outdoor unit having a control unit comprising a decision circuit which responds to the frequency signals received from said plurality of indoor units so as to obtain a maximum frequency, a minimum frequency and the number of



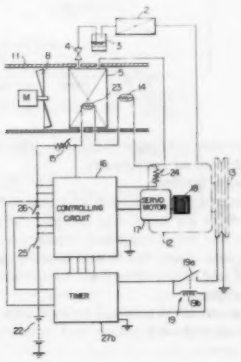
operating indoor units, a circuit for obtaining an operating frequency to be corrected, in response to said maximum frequency and the number of operating indoor units, a circuit for obtaining a correction value in response to the difference between said maximum and minimum frequencies and a circuit for determining an operation frequency which is applied to said variable-frequency power supply by subtracting said correction value from said operating frequency to be corrected.

4,480,443

AUTOMOTIVE REFRIGERATION SYSTEM

Yasuyuki Nishi; Masao Sakurai, both of Oobu, and Masashi Takagi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 27, 1982, Ser. No. 372,380
Claims priority, application Japan, Apr. 30, 1981, 56-66724; May 4, 1981, 56-67320; May 20, 1981, 56-77119
Int. Cl.³ F25B *27/00*; B60H *3/04*
U.S. Cl. 62—227 **3 Claims**



1. An automotive refrigeration system comprising:

a variable capacity refrigerant compressor adapted to be driven by an automotive engine and including means for varying the displacement of said compressor;

means for driving said compressor displacement varying means to vary the displacement of said compressor;

electric circuit means operative to assure the said compres-

sor displacement varying means are placed in a small compressor displacement position each time when the compressor operation is started;

wherein said electric circuit means include means for actuating said driving means to place said compressor displacement varying means in said small compressor displacement position when the engine operation is started;

a clutch for drivingly connecting and disconnecting said compressor to and from said engine;

wherein said electric circuit means further includes timer means for controlling said clutch so that the driving connection between said compressor and engine is delayed for a predetermined time period from the moment when the engine operation is started; and

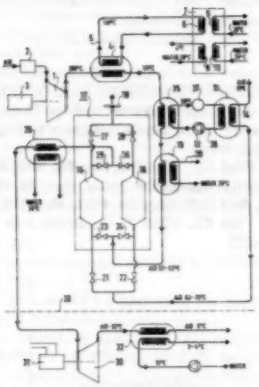
wherein said electric circuit means further include means for actuating said driving means to move said compressor displacement varying means from said small compressor displacement position to a large compressor displacement position after said compressor has been drivingly connected to said engine and for keeping said compressor displacement varying means in said large compressor displacement position for another predetermined time period.

4,480,444

DEEP MINE COOLING SYSTEM

Jean Conan, Kercradet, France, assignor to Alsthom-Atlantique, Paris, France

Filed May 23, 1983, Ser. No. 497,342
Int. Cl.³ F25D *9/00*
U.S. Cl. 62—402 **3 Claims**



1. A deep mine cooling system comprising:

a motor driven air compressor,

an expansion turbine,

conduit means coupling said air compressor to said expansion turbine for supplying compressed air to said expansion turbine for driving said expansion turbine,

a drying plant connected to said conduit means and intermediate of said motor driven air compressor and said expansion turbine,

a steam generator connected by said conduit means downstream of said compressor and upstream of said drying plant,

a first heat exchanger connected by said conduit means downstream of said steam generator and upstream of said drying plant,

said drying plant comprising a set of two cells,

said conduit means including means for alternately supplying compressed air from said compressor to said cells,

an absorption refrigeration system including a plurality of heat exchangers,

means for connecting the output of said steam generator to a heat exchanger of said absorption refrigeration system functioning as an energy source exchanger,

said first heat exchanger comprising a water circuit,

a second heat exchanger within said water circuit,

means for feeding air through said second heat exchanger and to one of said drying cells for regeneration of said drying cell by air from said second heat exchanger such that said second heat exchanger gives off calories absorbed by the water circuit derived from compressed air passing through said first heat exchanger,

said absorption refrigeration system comprising means to cool utility water for mining; whereby, the compressed air may be fed to said expansion turbine after leaving said drying plant,

a third heat exchanger connected by said conduit means to the output of said expansion turbine whose output may be distributed according to the needs of the mine,

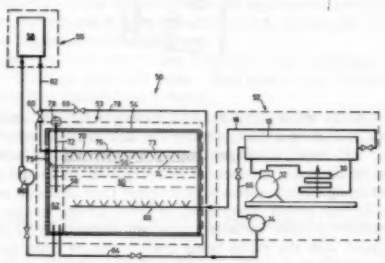
means for connecting water collected in the mine to said third heat exchanger for cooling in said third heat exchanger and permitting circulation upon leaving said third heat exchanger to meet the cool water requirements of the mine.

4,480,445

THERMAL STORAGE HEAT EXCHANGER SYSTEMS OF HEAT PUMPS

Vladimir Goldstein, 60 Basaltic Rd., Unit 9, Maple, Ontario, Canada (L0J 1E0)

Filed Jan. 21, 1983, Ser. No. 459,747
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—434 **6 Claims**



1. In a heat pump having a heat source, a heat sink and a thermal storage heat exchanger in which heat energy is cyclically accumulated and discharged by circulation of a secondary refrigerant therethrough, the improvement wherein:

(i) the secondary refrigerant is an aqueous solution having a concentration which is below its eutetic concentration,

(ii) the heat sink is adapted to super cool the aqueous solution to partially freeze it to generate a partially frozen solution in which fine ice particles are retained in suspension in a liquid secondary refrigerant,

(iii) the thermal storage heat exchanger has a storage chamber which is divided by a porous divider, into a first and second enclosures, said heat sink having an intake line communicating with said first enclosure for withdrawing liquid secondary refrigerant therefrom and an output communicating with said second enclosure for discharging said partially frozen secondary refrigerant into said second enclosure wherein said ice particles separate from the liquid to form a porous ice bed and a substantially ice free liquid bath, said heat source having an intake communicating with said first enclosure through which liquid secondary refrigerant is withdrawn from said chamber and an output communicating with said second enclosure through which heated liquid secondary refrigerant is discharged into said second enclosure such that it is placed

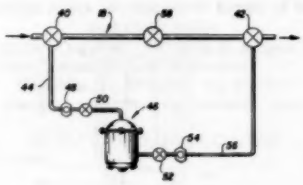
in intimate contact with the ice bed in a manner such that it may pass through the pores of the porous ice bed prior to its return to the bath.

4,480,446

METHOD AND APPARATUS FOR REHABILITATING REFRIGERANT

Allen L. Margulefsky, 1038 Peninsula Blvd., Woodmere, N.Y. 11598, and James F. Lutz, 13 John La., Levittown, N.Y. 11756

Filed Jul. 8, 1981, Ser. No. 271,447
Int. Cl.³ F25D *11/02*
U.S. Cl. 62—474 **13 Claims**



1. Portable apparatus for withdrawing and cleaning contaminanted liquid refrigerant from a non-functioning refrigeration system which has malfunctioned, for retaining the cleaned refrigerant and for continuously cleaning the same refrigerant after the malfunctioning refrigeration system has been repaired and set in operation, the refrigeration system including a predetermined volume of refrigerant, a compressor, a condenser coil an evaporator coil, a liquid line connecting the outlet of the condenser coil and the inlet of the evaporator coil, the portable apparatus comprising:

vertically oriented cylindrical tank means for receiving and retaining substantially all of the predetermined volume of liquid refrigerant of the non-functioning refrigeration system directly from the liquid line thereof and having upper inlet means at its upper end, and lower outlet means at its lower end;

said upper inlet means including inlet attaching means for connecting said upper inlet means in situ to the liquid line for direct liquid communication therewith downstream of the condenser coil;

said lower outlet means including outlet attaching means for connecting said lower outlet means in situ to the liquid line for direct liquid communication therewith upstream of the evaporator coil;

a liquid filter element disposed within said tank means between said inlet means and said outlet means for dividing the interior volume of said tank means into an upper contaminated liquid refrigerant receiving area and a lower clean liquid refrigerant receiving and retaining area and comprising means for liquid communication between said upper and lower areas and for cleaning the contaminated liquid refrigerant as it passes therethrough;

said upper inlet means including inlet valve means for selectively opening and closing liquid communication between said upper contaminated refrigerant receiving area and the outlet of the condenser coil via said inlet attaching means;

said lower outlet means including outlet valve means for selectively opening and closing liquid communication between said lower clean refrigerant receiving and retaining area and the liquid line upstream of the evaporator coil via said outlet attaching means; and

said tank means being substantially pre-evacuated to constitute the sole means for drawing the predetermined volume of contaminated liquid refrigerant from said refrigeration system into said tank means through said upper inlet means and for retaining the predetermined volume of liquid refrigerant when communication between said lower outlet means and the liquid line upstream of the evaporator coil is closed and the compressor is not operating.

4,480,447

FINGER RING AND INSERT THEREFOR

Albert C. Lodrini, R.F.D. #2, Box 124A, Stonington, Conn. 06378

Filed Jun. 24, 1982, Ser. No. 391,729
Int. Cl.³ A44C *9/02*
U.S. Cl. 63—15.6 **2 Claims**

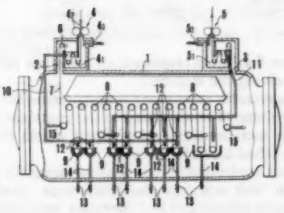
1. In a finger ring having a lower band portion with an inner edge defining a finger opening, the improvement comprising a saddle-shaped insert means having top and side walls adapted to fit over said lower portion of said band, a leaf spring, at least two peripherally spaced cavities which open only to said inner edge of said ring band, said insert means defining at least two projecting tabs adjacent end portions thereof and adapted to fit into said at least two cavities respectively, said leaf spring being disposed under said top wall and having at least one laterally projecting portion at its midpoint, said projecting spring portion being received in an aligned opening of said saddle-shaped insert means side wall, said leaf spring being resiliently deformed by bending when said tabs are so fitted into said cavities.

4,480,448

APPARATUS FOR WET-HEAT TREATING A CLOTH

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed Mar. 7, 1983, Ser. No. 473,041
Claims priority, application Japan, Mar. 17, 1982, 57-42076
Int. Cl.³ D06B *3/12, 23/18*
U.S. Cl. 68—5 E **8 Claims**



1. Apparatus for wet-heat treating a cloth in a high pressure steamer, which comprises a steamer body having a cloth inlet and a cloth outlet for correspondingly continuously inserting and removing a cloth to be treated in the steamer body, the cloth inlet being provided with an inlet side seal mechanism having a liquid seal tank for holding a treating solution and the cloth outlet being provided with an outlet side seal mechanism having a slow cooling tank for holding water, transport means for transporting the cloth continuously along a cloth passage in the steamer body from the cloth inlet to the cloth outlet and correspondingly in turn through the liquid seal tank and the slow cooling tank, a plurality of liquid apply tanks provided in the steamer body and arranged selectively along the cloth

passage, a treating solution apply pipe having treating solution supply valve means and extending from the liquid seal tank to the liquid apply tanks and arranged in the steamer body for selectively applying treating solution to the cloth in the liquid apply tanks, a hot water apply pipe having hot water supply valve means and extending from the slow cooling tank to the liquid apply tanks and arranged in the steamer body for selectively applying hot water to the cloth in the liquid apply tanks, said supply valve means being arranged for corresponding independent selective operation whereby either treating solution or hot water may be correspondingly applied selectively and repeatedly to the cloth in the respective liquid apply tanks from the liquid seal tank or the slow cooling tank upon selective operation of the corresponding supply valve means.

4,480,449

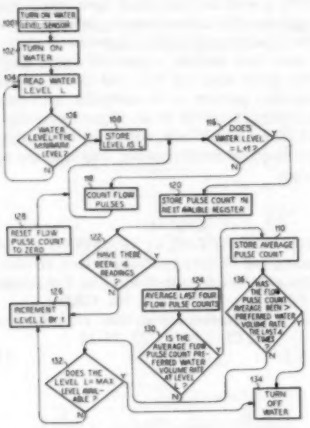
AUTOMATIC LIQUID LEVEL CONTROL FOR AUTOMATIC WASHERS

Edward H. Getz, Pipestone Township, Berrien County, and Clarence R. Ott, Jr., Lake Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 272,677, Jun. 11, 1981, Pat. No. 4,428,088. This application Jun. 16, 1983, Ser. No. 505,431

Int. Cl.[3] **D06F** *33/02, 39/08*

U.S. Cl. 68—12 R **5 Claims**


TURN ON WATER LEVEL SENSOR
TURN ON WATER
READ WATER LEVEL L
WATER LEVEL = THE MINIMUM LEVEL?
STORE LEVEL IS L
DOES WATER LEVEL = L + I?
COUNT FLOW PULSES
STORE PULSE COUNT IN NEXT AVAILABLE REGISTER
RESET FLOW PULSE COUNT TO ZERO
HAVE THERE BEEN 4 READINGS?
STORE AVERAGE PULSE COUNT
AVERAGE LAST FOUR FLOW PULSE COUNTS
INCREMENT LEVEL L BY I
IS THE AVERAGE FLOW PULSE COUNT PREFERRED WATER VOLUME RATE AT LEVEL L?
HAS THE FLOW PULSE COUNT INCREASED WITH PREFERRED WATER VOLUME RATE THE LAST 4 TIMES?
DOES THE LEVEL L = MAX LEVEL ALLOWABLE?
TURN OFF WATER

1. In a machine for liquid treatment of materials having a container for receiving the materials,

liquid control apparatus comprising sensing means for determining the volume of liquid added to the container which is required to increase the level of liquid within the container by specified increments, and

controller means controlled by said sensing means for determining from said volumes and increment levels the amount of liquid required in said container, said controller means introducing such required amount of liquid into said container.

4,480,450

ANTI-THEFT DEVICE FOR EYELET TYPE TRAILER HITCHES

Herschel J. Brown, 2330 W. Arata Rd., Space 51, Troutdale, Oreg. 97060

Continuation of Ser. No. 255,758, Apr. 20, 1981,. This application Sep. 9, 1983, Ser. No. 523,140

Int. Cl.[3] **E05B** *67/22, 73/00*

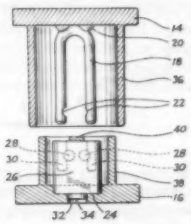
U.S. Cl. 70—14 **2 Claims**

1. For use with an eyelet type trailer hitch wherein a latch component is removably insertable in the opening of an associated eyelet component, an anti-theft device for preventing connection of such latch component with such eyelet component, comprising:

(a) a first imperforate eyelet-intercepting base member having a first imperforate base plate and a first elongated imperforate hollow shielding sleeve secured thereon, the first sleeve being configured to extend freely into the eyelet opening of an eyelet type trailer hitch,

(b) a two component lock having a first lock component mounted on said first imperforate base plate within said imperforate hollow shielding sleeve,

(c) a second eyelet-intercepting base member having a second base plate and a second elongated imperforate hollow shielding sleeve secured thereon, the second sleeve configured to extend freely into the eyelet opening of the



eyelet type trailer hitch and to telescope freely with said first sleeve, and

(d) the second lock component of said two component lock being mounted on said second base plate within said imperforate hollow shielding sleeve, a lock-operating portion of the second lock component being exposed at the outer surface of said second base plate through an opening therein for operating the lock, the second lock component closing the opening in the second base plate and thereby rendering the second base plate imperforate, the second lock component being arranged to engage the first lock component to releasably secure the two said base plates together whereby to prevent access to the two lock components contained within the interior of the shielding sleeves when the sleeves are in telescoped condition in the eyelet opening of an eyelet type trailer hitch.

4,480,451

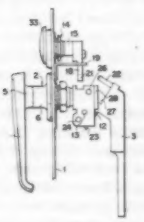
DOOR LOCK UNLOCKABLE FROM INDOOR SIDE

Toshimichi Fujiya, No. 4-22, Kounandai 6-chome, Kounan-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Mar. 2, 1983, Ser. No. 471,256

Int. Cl.[3] **E05B** *65/10;* **E05C** *9/04*

U.S. Cl. 70—92 **4 Claims**



1. A door lock unlockable from the indoor side comprising: a handle device including an indoor handle and an outdoor handle for operating a latch means for latching a door panel to a stationary frame; and a lock device adapted to be operated from the outdoor side so as to be brought into and out of

engagement with said indoor handle thereby to lock said indoor handle and said outdoor handle against rotation; said indoor handle being pivotally supported to as to be able to be swung towards and away from said door panel and adapted to be disengaged from said lock device by a predetermined swinging toward or away from said door panel, the engaging structure between said indoor handle and said lock device being exposed on the inner surface of said door panel.

4,480,452

ROLLING MILL

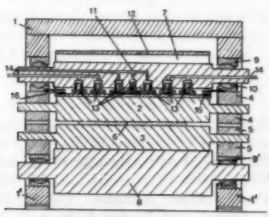
Eugen Schnyder, Ottenbach, Switzerland, assignor to Sulzer-Escher Wyss Limited, Zürich, Switzerland

Filed Mar. 21, 1983, Ser. No. 476,995

Claims priority, application Switzerland, Apr. 8, 1982, 2188/82

Int. Cl.³ B21B *13/14, 37/02, 37/08*

U.S. Cl. 72—16 **18 Claims**



1. A rolling mill for rolling web-like materials, comprising:

a roll stand;

two work rolls mounted in said roll stand;

two supporting rolls cooperating with said work rolls and mounted in said roll stand;

said two work rolls forming a roll nip therebetween and defining a pressing plane in which said work rolls act upon said material;

at least one of said rolls being structured as a controlled deflection roll comprising a stationary roll support supported in said roll stand and a rotatable roll shell rotatable about said stationary roll support;

said rotatable roll shell having an inner surface facing said stationary roll support and two opposite end portions and being displaceable in said pressing plane;

hydrostatic support elements acted upon by a pressurized fluid medium and supporting said rotatable roll shell at said stationary roll support;

a reference member connected with said roll stand;

at least one position transmitter for generating an output signal and serving to directly measure the position of said inner surface of said roll shell in said pressing plane at a side thereof facing said roll nip relative to said reference member;

control means responsive to said output signal of said position transmitter for adjusting said hydrostatic support elements and in turn a predetermined thickness of said web-like material being processed in said roll nip between said work rolls;

whereby said output signal of said position transmitter influences the pressure of the pressurized fluid medium acting upon said hydrostatic support elements by means of said control means such that said rotatable roll shell assumes a predetermined position.

4,480,453

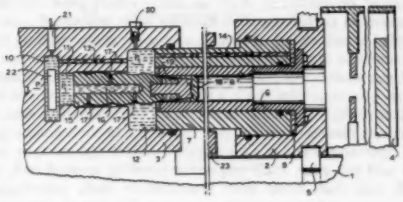
APPARATUS FOR BLAST HYDROPLASTIC FINISHING OF TUBULAR BILLETS

Georgi K. Petkov, Gabrovo, Bulgaria, and Peter I. Davidkov, deceased, late of Gabrovo, Bulgaria (by Stefka H. Davidkova, executrix), assignors to N P S P po Hydroplastichna Obrabotka na Metalite, Gabrovo, Bulgaria

Filed Dec. 9, 1983, Ser. No. 559,975

Int. Cl.³ B21D *22/10*

U.S. Cl. 72—56 **5 Claims**



1. An apparatus for the blast hydroplastic finishing of tubular billets, comprising a housing, a front stop and a back stop mounted on the housing, (and behind said front stop there is mounted a trapping hopper,) said back stop having a blast chamber and a work tool positioned in it, in the back stop and behind the blast chamber there are a guiding chamber and a compensating chamber, the three chambers being interconnected, a work tool positioned in the guiding chamber, said tool having a center blind hole and radial grooves connected thereto, in the front end of said work tool there being a gasket, in the front stop there being mounted a fixed ram and a traveling cylindrical piston with a center hole in which the tubular billet is disposed, said cylindrical billet at one end slipping on the fixed ram so that a recoil chamber is formed, the recoil chamber being connected to compensating chamber through longitudinal grooves in the traveling cylindrical piston.

4,480,454

SKEW-ROLLING MILL FOR REDUCING SOLID AND HOLLOW CROSS-SECTIONS

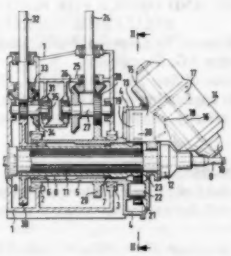
Alexander Svagr, Hilden, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,479

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113461

Int. Cl.³ B21B *19/02*

U.S. Cl. 72—78 **3 Claims**



1. A skew-rolling mill for reducing solid or hollow cross-sectional rolled stock, comprising: a stand; a roll carrier having a second hollow shaft extending therefrom rotatably supported in two positions in said stand; a first hollow shaft rotatably

mounted within and supported at both ends of said second hollow shaft to facilitate axial passage of the rolled stock therethrough; three roll head housings mounted on said roll carrier; three driven conical working rolls each rotatably mounted on a respective roll head housing at 120° circumferentially spaced intervals with their axes of rotation inclined with respect to and crossing at a short distance apart the longitudinal axis of the rolled stock, said conical working rolls being adjustable in the direction of their axes of rotation with respect to said axis of the rolled stock and each being mounted on a separate roll shaft rotatably mounted in a respective housing; a bevel gear mounted on each roll shaft; an intermediate shaft rotatably mounted in each respective housing with its axis of rotation parallel to said rolled stock axis; a bevel gear mounted on each intermediate shaft operatively engaging a respective one of said roll shaft bevel gears; an intermediate spur gear mounted on each intermediate shaft; a sun gear on one end of said first hollow shaft; three pinion shafts rotatably mounted on said roll carrier; a planetary pinion gear mounted on each pinion shaft and operatively engaging a respective intermediate spur gear and said sun gear; each respective housing, conical roll, roll shaft, roll shaft bevel gear, intermediate shaft, intermediate bevel gear and intermediate spur gear forming an integrated removable roll head assembly; means to adjustably and removably mount said roll head assemblies on said roll carrier so that each assembly can be rotatably adjusted about the axis of its respective intermediate shaft to adjust the angle at which its respective roll axis crosses said rolled stock axis comprising, a hollow cylindrical extension integral with and extending from each roll head housing having a circular peripheral outer surface extending axially toward said roll carrier, said intermediate spur gear being totally within said extension, a slot in said peripheral outer surface in a position and having a size to allow the radially outer portions of said intermediate spur gear and a respective one of said planetary pinion gears to penetrate into to facilitate meshing engagement thereof, three bores in said roll carrier extending parallel to the axis of rotation of said roll carrier and having their axes circumferentially spaced at 120° intervals, each of said bores removably and rotatably receiving an extension of a roll head housing, and a slot through the wall of each bore positioned and having a size to allow at least the radially outer peripheral portion of a respective one of said planetary pinion gears to penetrate into to facilitate said meshing engagement with a respective intermediate spur gear, a drive gear wheel non-rotatably connected to the other end of said first hollow shaft which projects from the respective end of said second hollow shaft; drive means to rotate said second hollow shaft; and drive means operatively engaging said drive gear wheel to rotate said sun gear in a manner to control the relative rotational speed of said rolls and said roll carrier so that said rolled stock passes through the rolling mill without rotating.

4,480,455

METHOD AND DEVICE FOR ROLLING TUBE TO A SMALLER DIAMETER

Albert J. Bramer, Vriezenveen, Netherlands, assignor to M and M Technics AG, Switzerland

Continuation of Ser. No. 142,992, Apr. 23, 1980, abandoned. This application May 14, 1982, Ser. No. 378,183

Claims priority, application Netherlands, Apr. 24, 1979, 7903234

Int. Cl.³ B21B *19/02*

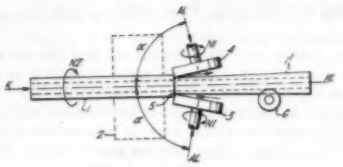
U.S. Cl. 72—95 **6 Claims**

1. A method of rolling an elongated round tube to a conical mast without the use of an internal mandrel comprising the steps of:

heating a section of the tube of limited axial length at a first location;

contacting the exterior of the heated section of the tube, at a second location, with the forming surface of a pair of rolls at circumferentially spaced points about the tube, said rolls being driven about axes lying in a common plane containing the axis of the tube and diverging toward the first location, the contact of tube and rolls providing circumferential movement of the tube with respect to the rolls for causing the forming surface to roll the tube to a smaller diameter in a conical configuration;

moving the tube longitudinally through the rolls from the



first location past the second location, said longitudinal movement being provided to the tube independently of the action of the rolls; and

moving the rolls inwardly toward the tube solely normal to the axis of the tube as the tube is longitudinally moved through the rolls to form the conical mast.

4,480,456

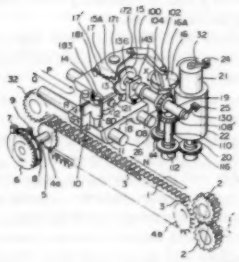
METHOD AND APPARATUS FOR CUTTING CONTINUOUS CORRUGATED MEMBERS

Takatoshi Iwase, Anjo; Kazunari Fuma, Toyota; Akira Nakagawa, Kariya, and Kouhei Hakamada, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 8, 1982, Ser. No. 396,362

Int. Cl.³ B21D *43/28*

U.S. Cl. 72—185 **22 Claims**



1. A method of forming corrugated members comprising the steps of:

delivering a continuous strip of material in a straight line while forming the strip into a corrugated configuration having a plurality of crests and troughs;

moving a cutting assembly in a reciprocating path along said straight line;

aligning the cutter assembly with a trough of the formed corrugated member at a point along the path of the cutter where the speed of the cutter is equal to the speed of the corrugated member while the cutter is moving in a direction opposite the corrugated member;

actuating the cutter while moving in the same direction as the corrugated member at the same point on the cutter path as the aligning point so as to cut the corrugated member at the trough.

4,480,457

PLANTS FOR MANUFACTURING SEAMLESS TUBES

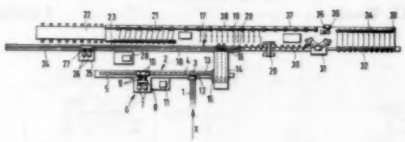
Hermann Möltner, Grevenbroich, Fed. Rep. of Germany, assignor to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 428,261

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3140015

Int. Cl.[3] B21B 17/06

U.S. Cl. 72—208 4 Claims



1. A plant for the manufacture of seamless tubes, having a single finishing push bench upstream of which is disposed at least one roughing unit, for stretching and reducing an ingot or pierced blank to form a roughed bloom, in which, in addition to the known one or two smoothing sizing passes, the number and arrangement of the drawing passes in said single finishing push bench is such that at one point in time they are all simultaneously engaged on a tubular bloom to be rolled.

4,480,458

CONTROLLED COUNTER-DRAFTING TO REDUCE CROP LOSS DURING INGOT ROLLING

Robert E. Bogovich, Munhall, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 18, 1983, Ser. No. 514,392

Int. Cl.[3] B21B 41/06, 1/00

U.S. Cl. 72—229 9 Claims

1. In the production of semifinished products from an ingot, which comprises; in an odd pass, feeding a leading end of the ingot between at least one pair of counter-rotating rolls of a roll system to squeeze the ingot therebetween to a smaller thickness, after the ingot has pased completely through the rolls, in the next (even) pass, reversing the rotation of the rolls and feeding the previously trailing end of the ingot between the reverse rotating rolls to further reduce the ingot thickness therebetween, without reheating the ingot, repeating said odd and even passes to produce a semifinished product, said ingot having an original thickness significantly thicker than twice the length of the maximum practically achievable arc of contact, $L_{max.}$ of said roll system,

the improvement for decreasing the amount of crop-loss caused by fishtails which result from said rolling, which comprises; during a first controlled stage of rolling, controlling the ratio of the drafts taken in said odd and even passes such that the draft taken in substantially all of said odd passes is lighter than the draft taken in said even passes, wherein said lighter drafts are 0.04 to 0.6 the draft of said heavier drafts.

4,480,459

ROLLING MILL

Hugo Feldman, Alsdorf-Warden, Fed. Rep. of Germany, and Heinz Güttinger, Schaffhausen, Switzerland, assignors to Escher Wyss Aktiengesellschaft, Zurich, Switzerland

Filed Nov. 3, 1982, Ser. No. 439,063

Claims priority, application Switzerland, Nov. 11, 1981, 7252/81

Int. Cl.[3] B21B 13/14, 31/32

U.S. Cl. 72—243 6 Claims

1. A rolling mill for rolling substantially web-like materials, comprising;

at least one work roll;

a counter roll with which cooperates said at least one work roll;

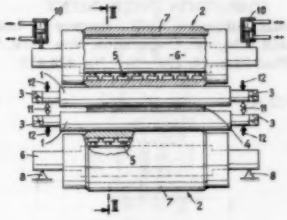
said work roll and said counter roll defining a press nip for the material to be rolled;

a support roll in engagement with said work roll;

said support roll comprising a controlled deflection roll;

said controlled deflection roll having a length of extent and comprising:

a stationary roll support;



a roll shell rotatable about said stationary roll support; and

support elements supporting said rotatable roll shell at said stationary roll support by exerting supporting forces therebetween;

bending devices coacting with said work roll at opposite ends thereof for applying a bending moment thereto; and

means connected to said bending devices for actuation thereof.

4,480,460

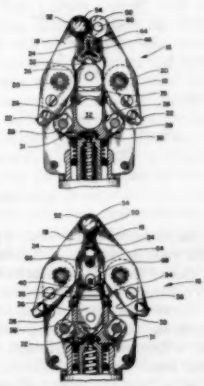
COMPRESSION TOOL

Austin L. Bush, Birmingham; Kenneth P. Apperson, Chaulkville, and Jerald C. Todd, Centerpoint, all of Ala., assignors to Square D Company, Palatine, Ill.

Filed Sep. 27, 1982, Ser. No. 424,795

Int. Cl.[3] B21D 7/06

U.S. Cl. 72—410 15 Claims



11. A compression tool for compressing a connector about a conductor having a hydraulic section operated by a pair of operating levers or other means, a head section having movably secured thereto a pair of elongated arms, each arm having a pointed nib thereon and each arm defining a portion of a connector receiving area, and a nest defined by a die against which the nibs act to compress a connector, the improvement comprising:

each pointed nib projecting into the connector receiving area so that said nib acts to indent a cylindrical type connector during crimping by movement of said arms and

a generally "C"-shaped section formed by said nibs when the arms are compressed together, and means for locking said arms together to maintain the generally "C"-shaped section, such that said nibs when locked together provide a compression portion in the connector receiving area such that an "H"-type connector can be compressed against the nest.

4,480,461

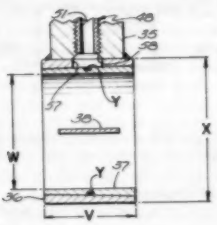
VIBRATION INSTRUMENT

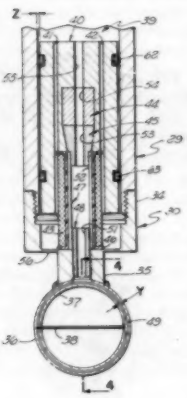
Joseph J. Ponzi, Alhambra, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 24, 1983, Ser. No. 478,432

Int. Cl.³ G01N *9/00*

U.S. Cl. 73—32 A **12 Claims**





1. A vibration densitometer comprising: a probe including a head; a rectangular vane having parallel sides fixed relative to said head; and a closed loop electromechanical oscillator including a sensor to detect the frequency of vibration of said vane, a driver to vibrate said head and said vane, and means to energize said driver, said driver causing said head to vibrate along a first axis, a first hollow cylinder, a second hollow cylinder telescoped inside said first hollow cylinder, said first hollow cylinder being fixed to the end of said head, said first and second cylinders having a common symmetrical second axis, said first hollow cylinder being fixed to said head with an orientation such that said second axis lies normal to said first axis, said vane being fixed approximately in a diametral plane across the interior of said second hollow cylinder, said vane sides being fixed at respective positions around the interior wall of said second hollow cylinder, said first and second hollow cylinders having an interference fit, the interior surface of said first hollow cylinder having a taper such that the diameter at one end thereof is greater than that at the other end thereof, said second hollow cylinder having an external surface of a shape nesting inside said first hollow cylinder, the exterior of said second hollow cylinder having a taper such that the diameter thereof at said first cylinder one end is greater than the diameter thereof at said first cylinder other end.

4,480,462

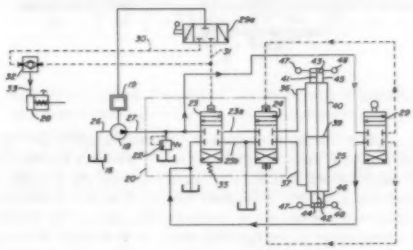
HYDROSTATIC TEST APPARATUS

Darwin A. Miller, Houma, La., assignor to Damco Testers, Inc., Houma, La.

Filed Oct. 25, 1982, Ser. No. 436,619

Int. Cl.³ G01M *3/02*

U.S. Cl. 73—37 **5 Claims**



1. A portable hydrostatic test system comprising: a frame, a self-contained hydraulic pressure generating system positioned on the frame and including engine driven pump means for pressurizing a hydraulic fluid, valve means for selectively connecting said pump means to a hydrostatic pressurizing means to impose a desired pressure upon an element of a hydrostatic system connected to said pressurizing means, pneumatically operated control means to vary the position of a spring biased directional control valve in said hydraulic pressure generating system, said control means including a unitary, manually operated, three position directional control valve pneumatically connected to speed control means for an engine to drive said pump and pneumatically connected to one side of said spring biased directional control valve, said manually operated directional control valve being operable to control said engine at either of two positions of said manually operated direction control valve and to operate said spring biased directional control valve at only one position of said manually operated directional control valve.

4,480,463

PROCESS FOR DETERMINING THE RESISTANCE TO DRAW AND THE GAS PERMEABILITY OF A TEST PIECE AND A DEVICE FOR CARRYING OUT SUCH A PROCESS

Gerd Schumacher, Pinneberg-Waldenau, and Heinz-Werner Masurat, Pinneberg, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,913

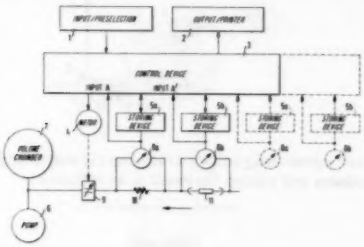
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1981, 3111318

Int. Cl.³ G01N *15/08*

U.S. Cl. 73—38 **15 Claims**

2. A device for determining the resistance to draw and the gas permeability of a test piece comprising a source producing an adjustable volumetric gas flow, a support for the test piece, said support being connected with said source, a flow meter for generating continuously measured values corresponding to the volumetric flow of said gas, a first pressure gauge for measuring continuously the change in pressure across the test piece and an evaluating device, wherein said evaluating device further includes a memory containing predetermined reference values, a comparator for comparing the measured values for gas flow and change in pressure across the test piece with the

predetermined reference values, and means for detecting instantaneous values for both gas flow and change in pressure across the test piece when equality exists between any predetermined reference value and any measured values corresponding either to gas flow or to change in pressure across said test



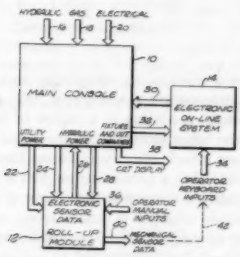
piece, wherein the measurement of gas flow enables a determination of gas permeability and the measurement of change in pressure across the test piece enables a determination of resistance to draw, and wherein said source creates a linearly increasing or decreasing gas flow.

4,480,464

GENERAL PURPOSE HYDRAULIC TEST STATION

Neal Whisenand, Palmdale, and Richard Tauber, Northridge, both of Calif., assignors to HR Textron Inc., Valencia, Calif.

Filed Feb. 28, 1983, Ser. No. 470,361
Int. Cl.³ G01M *3/26*
U.S. Cl. 73—40 **23 Claims**



1. A general purpose hydraulic test station for testing hydraulic devices comprising:

(A) a housing defining a plurality of hydraulic ports;

(B) a source of hydraulic fluid under pressure;

(C) a hydraulic return; and

(D) manifold means connected to at least one of said ports and including:

(1) first valve means,

(2) means interconnecting said first valve means with said one port and with said source and with said return, and

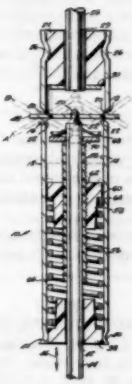
(3) control means for energizing said first valve means to selectively connect one only of said source and said return to said at least one port at any one time.

4,480,465

DEVICE FOR DEPENDENTLY SUPPORTING POTTED PLANTS HAVING VISUAL MOISTURE-INDICATING MEANS

John G. Chase, 1602 E. Dorchester Dr., Palm Harbor, Fla. 33563

Filed Jul. 28, 1983, Ser. No. 518,004
Int. Cl.³ A01G *9/02*; **G01D** *11/00*
U.S. Cl. 73—73 **19 Claims**



1. A device for visually indicating the moisture content of a potted plant comprising:

a housing member defining a central cavity adapted to being dependently supported from a fixed object and including means defining a pair of substantially opposing openings, each said opening defining a pair of fulcrum surfaces;

an elongated flexible member disposed in said pair of openings and having visual moisture indicating portions outwardly extending from each of said openings; and

plant supporting means to support said potted plant and disposed in said central cavity, said plant supporting means including means permitting slideable reciprocal movement of said plant supporting means between first and second positions relative to said housing member in dependence upon the moisture content of said potted plant supported thereby, said plant supporting means being connected to said flexible member for flexibly displacing said visual moisture indicating portions in a first direction by bringing said flexible member into bearing contact with a predetermined one of said pair of fulcrum surfaces of each of said openings in response to said supporting means being displaced into said first position, and for flexibly displacing said visual moisture indicating portions in a second direction by bringing said flexible member into bearing contact with the other one of said pair of fulcrum surfaces of each of said openings in response to said supporting means being displaced into said second position wherein said visual moisture indicating portions in said first position visually indicate a high moisture content of said potted plant while said visual moisture indicating portions in said second position visually indicate a low moisture content of said plant.

4,480,466

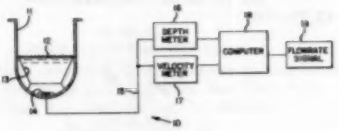
APPARATUS AND METHOD FOR DETERMINING LIQUID FLOWRATE

Wendall C. Gates, Box 2070, Santa Cruz, Calif. 95063

Filed May 20, 1983, Ser. No. 496,548
Int. Cl.³ G01F *1/20*
U.S. Cl. 73—195 **9 Claims**

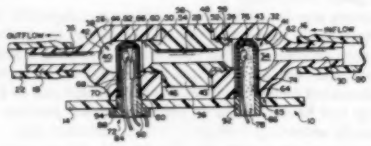
1. A flowmeter for measuring the flow of liquid in a channel or other conduit of known channel geometry, comprising:

liquid depth measurement means;
liquid velocity measurement means;
computer means for calculating a flowrate based on depth measurement, for calculating a velocity based on said flowrate and channel geometry, for making a comparison of said calculated velocity with velocity measured by the



velocity measurement means, and for evaluating the calculated flowrate using said comparison, and then for making a selection of one of said calculated flowrate and an alternate flowrate determination based on measured velocity;
means for implementing said selection to produce a signal corresponding to determined flowrate.

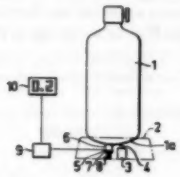
4,480,467
FLOW MONITORING DEVICE
James R. Harter, and Gary M. Freeman, both of Miami, Fla., assignors to Hyperion, Inc., Miami, Fla.
Filed Nov. 29, 1982, Ser. No. 444,999
Int. Cl.³ G01F *1/68, 15/14*
U.S. Cl. 73—204 **38 Claims**



18. For use in a flow monitoring device, a housing assembly comprising first and second identical end parts each having a nozzle at one end with a passageway extending through said nozzle and having a wider diameter body portion with a cavity therein having a larger cross-section than said passageway, and a middle part having a central body portion with identical bosses extending therefrom, each boss being adapted to be received in one of the larger cross-section cavities in one of said end parts and having a central passageway therethrough, a sensing chamber being defined by each larger cross-section cavity and the boss received therein, and the inlet and outlet ends of each chamber gradually widening from respective smaller-in-diameter passageway portions to the larger cross-section cavity to minimize turbulent flow through each chamber defining cavity.

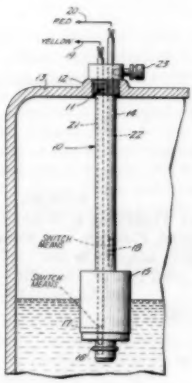
4,480,468
APPARATUS FOR MEASURING AND INDICATING THE FLUID LEVEL IN VESSELS
Brajnandan Sinha, 17 Tunnlandsvägen, S-175 46 Järfälla, Sweden
PCT No. PCT/SE81/00318, § 371 Date Jun. 21, 1982, § 102(e) Date Jun. 21, 1982, PCT Pub. No. WO82/01584, PCT Pub. Date May 13, 1982
PCT Filed Oct. 28, 1981, Ser. No. 395,017
Claims priority, application Sweden, Oct. 29, 1980, 8007596
Int. Cl.³ G01F *23/28*
U.S. Cl. 73—290 V **10 Claims**

1. An apparatus for measuring and indicating the fluid level in vessels comprising a mechanically operating arrangement or a pulse device for initiating a vibration of the vessel wall, a transducer for sensing the oscillation progress varying both in frequency and amplitude with the degree of filling of the ves-



sel, and a processing unit for evaluating the output signal of the transducer and passing the result to an indicator.

4,480,469
ADJUSTABLE DIFFERENTIAL FLUID LEVEL FLOAT INDICATOR
Charles Tice, Plantsville, Conn., assignor to Transamerica DeLaval Inc., Princeton, N.J.
Filed Oct. 25, 1982, Ser. No. 436,354
Int. Cl.³ G01F *23/12*; H01H *36/00*
U.S. Cl. 73—308 **2 Claims**



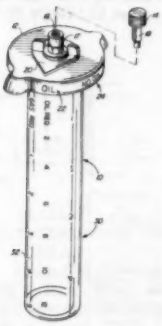
1. A fluid-level transducer, comprising an elongate outer tube of material transparent to a magnetic field, said tube being adapted for vertical mounting in a region of liquid levels of interest, said tube being closed at its lower end and having a mounting adapter which effectively closes its upper end, an annular float containing a permanent magnet and surrounding said tube for guidance thereon in the course of float action in response to buoyed changes in liquid level, a first elongate suspension tube of magnetically transparent material within said outer tube and fixedly mounted to and suspended from said adapter, said first suspension tube fixedly containing a first hermetically sealed magnetically sensitive electrical switch potted in position near the lower end of said outer tube, and a selectively movable second elongate suspension tube of magnetically transparent material alongside said first suspension tube and within said outer tube and said second suspension tube being adjustably clamped to and suspended from said adapter, said second suspension tube fixedly containing a second hermetically sealed magnetically sensitive electrical switch potted in position in said second suspension tube near said adapter, the substantial range of mountable adjustment of said second suspension tube being such as to position said second switch above the effective elevation of said first magnetic switch for control activation of said second switch.

4,480,470

GAS CAP

Dennis M. Tussing, Tempe, Ariz. 85281

Filed Jun. 1, 1982, Ser. No. 383,716
Int. Cl.³ G01F *19/00*
U.S. Cl. 73—427 **7 Claims**



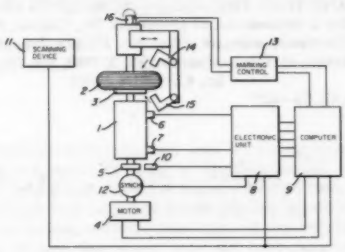
1. An improved sealing-cap for a fuel tank comprising, in combination:
- closure means having a removable closure for engaging said tank;
- measuring means having a graduate coupled to the tank-side of said closure for providing an oil-measuring receptacle;
- dipstick means in communication with said graduate for providing a measure of the quantity of gas required to fill said tank to a desired fuel mixture level;
- conversion means adjoining said dipstick means for providing a measure of the quantity of oil required to fill said tank to a desired fuel mixture level;
- indicator means coupled to said cap for indicating whether said tank contains an oil mixture; and
- vent means coupled to said cap for permitting the interior of said tank to be selectively vented.

4,480,471

METHOD AND APPARATUS FOR MARKING THE UNBALANCES ONTO A ROTATING BODY, ESPECIALLY AN AUTOMOBILE WHEEL

Horst Kögler, Eulengasse, and Peter Drust, Griesheim, both of Fed. Rep. of Germany, assignors to Gebr. Hofmann GmbH & Co. Kg, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,766
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115609
Int. Cl.³ G01M *1/26*
U.S. Cl. 73—462 **23 Claims**



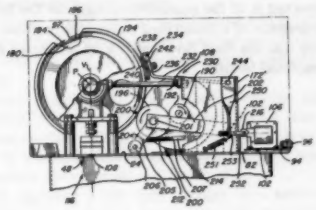
1. A method for marking unbalances on a rotatable body, with said body being provided with marks at angular locations depending on the amount and location of unbalance determined by unbalance measuring equipment, said method comprising:
- determining dimensions of a body to be marked;
- rotating the body and determining the amount and location of unbalance;
- moving a marking device about an axis of rotation of the body; and
- providing at least one mark at a predetermined and radially controlled radius on the body depending on the dimensions of the body, with said at least one mark representing the amount and location of the unbalance determined, said at least one mark representing the magnitude of a correction mass to be attached to the body and said at least one mark defining a location for placement of the edge of the correction mass.

4,480,472

ELECTRONIC WHEEL BALANCER FOR VEHICLE WHEELS

John F. Wood, Brentwood, Tenn., assignor to Hofmann Corporation Automotive Service Equipment, Lynchburg, Va.

Filed Aug. 10, 1982, Ser. No. 406,873
Int. Cl.³ G01M *1/18*
U.S. Cl. 73—462 **8 Claims**



1. Apparatus for measuring unbalance in a vehicle wheel, said apparatus comprising:
- drive shaft for carrying the vehicle wheel to be balanced;
- means for mounting the wheel to the drive shaft;
- means responsive to the rotation of said drive shaft and said wheel for measuring and indicating the unbalance in said vehicle wheel;
- motor means having a drive wheel rotating in a predetermined direction; and
- engaging means operative in a first mode for placing the drive wheel into an operative relationship with the drive shaft to cause said drive shaft to rotate at a predetermined speed, and operative in a second mode for disengaging the drive shaft with the drive wheel in order to permit free rotation of the drive shaft, said engaging means including a flywheel fixed to rotate on said drive shaft; an idler wheel; and means for placing said idler wheel into intimate contact with the drive wheel of the motor means and the peripheral portion of the flywheel when said engaging means is in said first mode of operation and for withdrawing said idler wheel away from engagement with the motor means and the peripheral surface of the flywheel when said engaging means is in said second mode of operation.

4,480,473

ACOUSTIC INSPECTION METHOD

John H. Varterasian, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

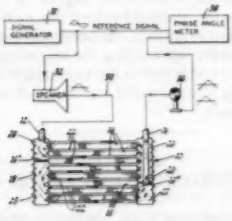
Filed May 26, 1983, Ser. No. 498,633
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—596 **3 Claims**

1. An acoustic inspection method for determining whether the actual fluid flow path through a manufactured fluid flow

system such as a heat transfer core is of a prescribed length and thereby free of such manufacturing errors as cause a shortened or lengthened fluid flow path comprising the steps of:

(1) passing a test sound wave of predetermined frequency along the actual fluid flow path through the manufactured fluid flow system,

(2) comparing the phase angle of the test sound wave at the



exit of the actual fluid flow path being inspected with that of a reference sound wave of the same frequency passing along the exactly prescribed fluid flow path length, and

(3) detecting whether or not the actual fluid flow path being inspected is of the prescribed length on the basis that the occurrence of a prescribed difference in phase angle indicates that the fluid flow path being inspected is not of the prescribed length.

4,480,474

METHOD AND APPARATUS FOR ULTRASONIC FLAW DETECTION OF T-WELDED PORTION OF STEEL PRODUCT

Hisao Kazama; Akito Nakanishi, and Katsuichi Nakayama, all of Ibaragi, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Dec. 10, 1982, Ser. No. 448,825
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—600 **11 Claims**

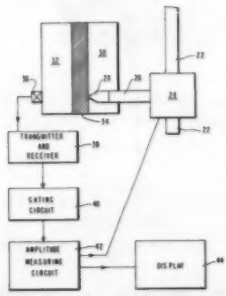
1. A method for the flaw detection of a T-welded portion of a steel product formed by T-welding a web member to a flange member, which comprises maintaining the flange portion horizontally, making convergent ultrasonic beams incident on the flange portion perpendicular to the top face of the flange portion through an ultrasonic transmission medium, scanning the incident beams transversely of the line of intersection between the flange member and the web member, detecting ultrasonic reflections from a depth corresponding to the thickness of the flange portion, and comparing the level of said ultrasonic reflections with a predetermined threshold value.

4,480,475

REAL-TIME ULTRASONIC WELD INSPECTION METHOD

Mike C. Tsao, Groton, Conn., and James F. Mancuso, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1983, Ser. No. 461,883
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—610 **2 Claims**



1. A method for ultrasonically inspecting welds during the welding process comprising:

moving a welding electrode relative to members to be welded thereby establishing a molten metal weld pool between said members;

positioning an ultrasonic transducer near said molten metal weld pool for transmitting an ultrasonic signal to said molten metal weld pool and for receiving a reflected signal from said molten metal weld pool;

selectively filtering said reflected signals from areas other than said molten metal weld pool and selectively accepting for comparison said reflected signals from said molten metal weld pool;

comparing the amplitude of said accepted reflected signal to a predetermined maximum allowable amplitude for determining whether said accepted reflected signal is less than or equal to said maximum thereby indicating the absence of substantial defects in said molten metal weld pool; and

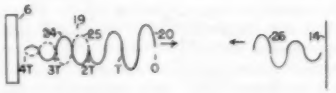
maintaining said welding electrode at a given location until said accepted reflected signal is less than or equal to said maximum while maintaining said molten metal weld pool in liquid state thereby dissipating defects in said molten metal weld pool.

4,480,476

PROCESS FOR CAUSING AN INTERFACE TO VIBRATE AND THEN TRUNCATING RESULTING RINGING

Arthur J. Samodovitz, 67 Overbrook Dr., Colonia, N.J. 07067

Continuation-in-part of Ser. No. 277,139, Jun. 24, 1981, abandoned. This application Feb. 2, 1983, Ser. No. 463,131
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—627 **20 Claims**



1. A process for causing an interface to vibrate and then truncating resultant ringing of the interface, comprising:

transmitting an acoustic wave towards the interface, said acoustic wave comprising first and second parts, each part

having approximately the same main frequency, and the second part being transmitted at a time after the first part such that an imaginary continuation of the first part would be substantially out-of-phase with the second part, and such that the second part reaching the interface while the interface is still significantly ringing from the first part.

4,480,477

ELECTRODYNAMIC INSTRUMENT TRANSFORMER HEAD

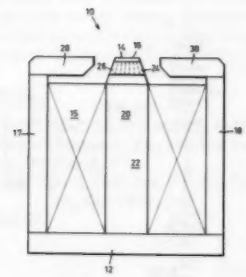
Gerhard Hüschelrath, Laufach-Frohnhofen; Ewald Kowol, Wehrheim, and Ursula Orthen, Hanau, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau am Main, Fed. Rep. of Germany

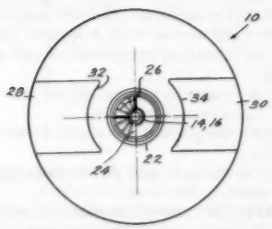
Filed Jun. 10, 1982, Ser. No. 387,148

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1981, 3123935

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—643 **8 Claims**





1. An electrodynamic transducer head for the non-destructive testing of materials by means of ultrasonic energy, comprising an electromagnet having a magnet yoke with outer and inner pole shoes, said outer pole shoes surrounding said inner pole shoe, an exciting coil and a receiving coil, said coils being disposed in an area that, in use, faces the work piece being tested, said area being located on the end section of said inner pole shoe, said end section having generally radially extending slots and said end section being tapered in the direction of the work piece to be tested and having the shape of a truncated cone.

4,480,478

PRESSURE SENSOR EMPLOYING SEMICONDUCTOR STRAIN GAUGE

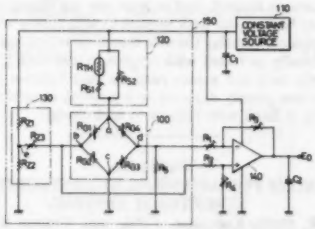
Hideo Sato, Hitachi; Motohisa Nishihara, Katsuta; Kazuji Yamada, Hitachi, and Seikou Suzuki, Hitachiohta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1983, Ser. No. 466,027

Claims priority, application Japan, Feb. 17, 1982, 57-22633

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—708 **8 Claims**



1. A pressure sensor comprising:

a bridge circuit which has two arms connected at both their ends, and which includes at least one semiconductor strain gauge between two middle points thereof and one end of the arm,

a sensitivity temperature compensation circuit which is connected in series with said bridge circuit, and which varies an applied voltage of said bridge circuit in dependence on a temperature so as to compensate a sensitivity temperature characteristic of said bridge,

means for applying a constant voltage to a series circuit consisting of said bridge circuit and said sensitivity temperature compensation circuit,

amplification means for differentially amplifying voltages at said middle points of said two arms of said bridge circuit, and

a zero-point temperature compensation circuit by which a point of a voltage equal to a potential of the middle point of one arm of said bridge circuit at the time when said semiconductor strain gauge is unstrained and is at a predetermined temperature is connected to said middle point of said one arm of said bridge circuit through a resistor.

4,480,479

TONOMETER

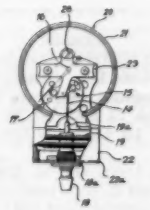
Masayuki Enatsu, Tokyo, Japan, assignor to Kabushiki Kaisha Medos Kenkyusho, Japan

Filed Dec. 27, 1982, Ser. No. 452,933

Claims priority, application Japan, Dec. 28, 1981, 56-198775[U]

Int. Cl.³ G01L *7/06*

U.S. Cl. 73—729 **7 Claims**



1. In a tonometer including a casing defining an interior, said

casing having main and bottom portions, bellows means mounted in the interior of said casing bottom portion, rod means resting on said bellows means adapted to be axially shifted by said bellows means as the latter expands and contracts, a base plate having a thickness mounted in the interior of said casing main portion, a pointer rotatably mounted on said casing, and amplifying means mounted on said base plate in operative assocation with said rod means for swinging said pointer an amount corresponding to a degree of expansion or contraction of said bellow means, the improvement comprising:

said base plate includes at least one leg means forming an extension thereof, said at least one leg means of said base plate being fixed with respect to said casing with said leg means constituting the sole means by which said base plate is fixedly mounted with respect to said casing, and

wherein said rod means rests on said bellows means at a position closely adjacent to a position at which said base plate is fixed with respect to said casing.

4,480,480

SYSTEM FOR ASSESSING THE INTEGRITY OF STRUCTURAL SYSTEMS

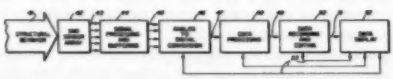
David R. Scott, Lancaster, Calif., and Thomas S. Rhoades, Colorado Springs, Colo., assignors to Scott Science & Technology, Inc., Lancaster, Calif.

Continuation-in-part of Ser. No. 265,031, May 18, 1981, abandoned, and Ser. No. 371,321, Apr. 26, 1982, Pat. No. 4,409,842, each is a continuation-in-part of Ser. No. 86,772, Oct. 22, 1979, Pat. No. 4,287,511. This application Apr. 27, 1982, Ser. No. 371,802

The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.

Int. Cl.[3] **G01L** *1/26*

U.S. Cl. 73—769 **1 Claim**



1. A system for collecting and interpreting data reflecting the effect of at least a selected one of a plurality of forces acting on a structure, said system comprising, in combination:

(a) at least one structural moment detector carried by said structure for generating the output signals in response to said plurality of forces acting on said structure, said structural moment detector being responsive to deflection of said structure by bending changes induced by said forces and being insensitive to linear distortions of said structure caused by said forces;

(b) electronic circuit means for processing said output signals to modify the information content thereof, including rejecting components of said signals which reflect the effects of extraneous forces other than said selected one; and

(c) means for manipulating said processed signals to provide secondary signals responsive to the condition of said structure as a result of the application of said selected force.

4,480,481

MEANS AND METHOD FOR SOIL TESTING

Wesley F. Buchele, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 22, 1983, Ser. No. 468,462

Int. Cl.[3] **G01N** *3/00*

U.S. Cl. 73—784 **16 Claims**

1. A soil testing device used to determine the Coulomb parameters of soil, said device comprising:

a first shaft with opposite upper and lower ends,

a torsion spring mounted on said first shaft,

a soil engaging plate secured to said lower end of said first shaft and having soil engaging vanes extending downward therefrom,

a torque knob journaled about said upper end of said first shaft,

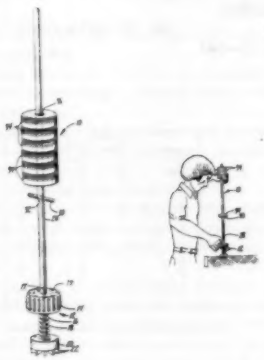
a dial secured to said upper end of said first shaft adjacent to said torque knob and having calibrations thereon,

a second shaft secured to said upper end of said first shaft, the longitudinal axis of said first shaft aligning with that of said second shaft,

a plurality of weights adapted slidably receive said second shaft, and

a means on said second shaft for supportive engagement of said weights.

15. A method of determing the Coulomb parameters of soil using a shearometer device comprising a first shaft with opposite upper and lower ends, a torsion spring mounted on said first shaft, a soil engaging plate secured to said lower end of said first shaft and having soil penetrating vanes extending downwardly therefrom, a torque knob journaled about said upper end of said first shaft and attached to said torsion spring, a calibrated dial with markings corresponding to shearing stress of soil when known forces are applied to said soil secured to said upper end of said first shaft adjacent to said torque knob, a reference mark on said torque knob adjacent said dial,



a second shaft secured to said upper end of said first shaft with the longitudinal axis of said first shafts aligning with that of said second shaft, a plurality of cylindrical weights adapted to slidably receive said second shaft, a support means on said second shaft for supportive engagement of said weights, said method being:

setting said soil engaging plate on the soil to be tested such that said vanes penetrate the soil,

maintaining the longitudinal axis of said device in a vertical orientation,

placing said weights on said device and supporting said weights with one first hand,

rotating said torque knob with the other second hand during continuous shearing condition of the soil,

recording said value on a graph with said second hand,

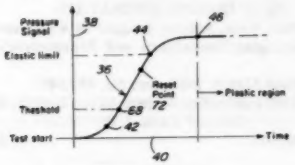
releasing one of said weights by said first hand with the aid of said second hand such that said weight is supported by said support means on said second shaft whereby a constant known principle stress is applied to the soil, rotating said torque knob with said second hand while supporting said remaining weights with said first hand until the soil begins to shear, reading said shear, plotting said value on a graph with said second hand, and repeating this sequence until all of said weights have been released, and

determining Coulomb parameters from said graph.

4,480,482
ELASTIC LIMIT DETECTION AND RESET TESTING SYSTEM

Robert R. Henry, 307 Lakeside Dr., Lafayette, La. 70508, and William C. Heldenbrand, P.O. Box 2066, New Iberia, La. 70560

Filed Dec. 29, 1982, Ser. No. 454,323
Int. Cl.³ G01N 3/10
U.S. Cl. 73—805 5 Claims

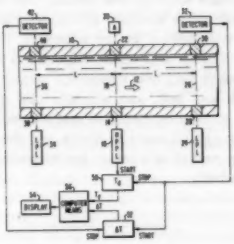


4. In combination with a static stress testing apparatus for applying an increasing load to a test specimen having an elastic limit below which the specimen exhibits a substantially linear stress-strain characteristic, transducer means connected to the apparatus for continuously measuring the load applied to the specimen during a test interval, signal differentiating means connected to the transducer means for generating an analog signal substantially proportional to the rate of change of said increasing load, reset means responsive to excessive deviation of said analog signal from a substantially constant level for interrupting operation of the testing apparatus to terminate said test interval and means for disabling the reset means below a minimum value of the load applied to the test specimen.

4,480,483
ACOUSTO-OPTICAL ULTRASONIC FLOWMETER

James L. McShane, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 6, 1983, Ser. No. 482,736
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.05 9 Claims

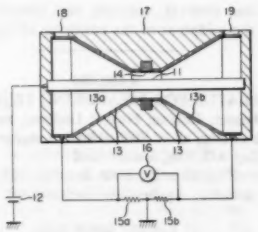


1. Flowmeter apparatus for obtaining flow related data of a fluid flowing in a fluid conveyance comprising:
(a) an optical window in the wall of said fluid conveyance;
(b) pulsed laser apparatus positioned to project a laser beam into said fluid through said optical window;
(c) said pulsed laser apparatus being of sufficiently high power density and short duration so as to cause a rapid thermal expansion of the fluid in the path of said beam, said thermal expansion generating a corresponding pressure wave, said beam within said conveyance acting as a line source of said pressure wave;
(d) first detecting means disposed from said beam and operable to detect said pressure wave as it passes, to provide a corresponding indication thereof:
(e) at least a second detecting means disposed from said beam and operable to detect said pressure wave as it passes, to provide a corresponding indication thereof:
(f) signal processing means responsive to said indications to provide said flow related data.

4,480,484
FLOW RATE DETECTION DEVICE

Yoshiji Ueyama, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00112, § 371 Date Dec. 6, 1982, § 102(e) Date Dec. 6, 1982, PCT Pub. No. WO83/03668, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 8, 1982, Ser. No. 451,202
Int. Cl.³ G01F 1/56
U.S. Cl. 73—861.08 3 Claims



1. A flow meter comprising an electric field forming means disposed in a flow path of a dielectric fluid and having a central electrode and a circumferential electrode radially opposing to an outer periphery of said central electrode so as to form an electric field in the flow path of said dielectric fluid, said electrodes arranged such that said electric field has its intenstiy changed along said fluid flow path by applying a voltage between said individual electrodes, and further comprising a current detecting means operatively connected to said electrodes for detecting a dielectric polarization current flowing when said dielectric fluid flows through the interior of said electric field forming means;
wherein said central electrode comprises a rod shaped structure having its axis arranged along said fluid flow path and said circumferential electrode comprises a cylindrical structure whose diameter first decreases and then increases in a direction along its axis, said axis of said circumferential electrode being along said fluid flow path.

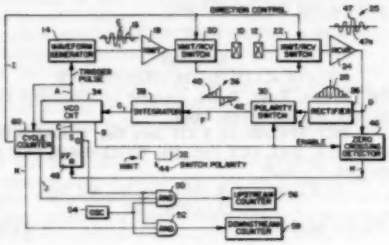
4,480,485
ACOUSTIC FLOWMETER WITH ENVELOPE MIDPOINT TRACKING

James E. Bradshaw, Tyngsboro, and Norman E. Pedersen, Newburyport, both of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Filed Oct. 1, 1982, Ser. No. 432,353
Int. Cl.³ G01F 1/66
U.S. Cl. 73—861.28 17 Claims

1. An acoustic flowmeter comprising
means responsive to a trigger pulse for transmitting a burst of acoustic energy having a characteristic amplitude envelope along a flow axis of a fluid medium,
means displaced axially from said transmitting means for receiving said burst,
means for detecting the envelope of said received burst,
variable frequency means responsive to an error control signal for generating a periodic output signal indicative of the midpoint of the received envelope,
means responsive to said received envelope for generating said error control signal indicative of a time interval between said output signal and the actual midpoint of said received envelope,

said variable frequency means having means for adjusting the frequency of said output signal in a direction to reduce



said time interval, whereby said output signal tends to track the midpoint of the envelope of received signals.

4,480,486

APPARATUS FOR MEASURING LIQUID FLOW

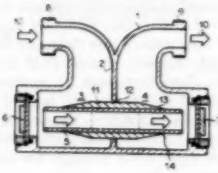
Claudio Meisser, Goldau; Hubert Lechner, and Benedikt Steinle, both of Zug, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Feb. 23, 1983, Ser. No. 469,043

Claims priority, application Switzerland, Mar. 1, 1982, 1227/82

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.28 **7 Claims**



1. In a measurement generator for determining the rate of flow of a fluid passing through a pipe system, said pipe system including a housing and a test tube of a predetermined length disposed within said housing, said test tube extending along a longitudinal direction, the fluid flow being determined by measuring the transit time of ultrasound pulses within the fluid flowing through said test tube, a sound pulse emitting transducer being disposed near one end of said test tube in a first distribution chamber, said sound pulse emitting transducer having a first sound-transfer area, a sound-pulse receiving transmitter being disposed near the other end of said test tube in a second distribution chamber, said sound-pulse receiving transducer having a second sound transfer area, at least one distribution chamber forming part of said housing, said test tube including metallic material having a cross-section remaining the same over the entire length of said test tube, a common divider wall having an opening and separating said distribution chambers from one another, said test tube passing through said opening, said transducers being disposed at a certain distance from the respective test tube ends, said test tube guiding the ultrasound pulses from said sound transfer area of said sound-pulse emitting transducer to said sound transfer area of said sound-pulse receiving transducer along an axis coinciding with the flow of said test tube, the improvement comprising

non-metallic connecting means extending along and surrounding said test tube so as to connect portions near opposite ends thereof through said opening in said common dividing wall, said common dividing wall extending approximately at right angles to said longitudinal direction,

whereby an, sound echoes bouncing off said common divided wall are reduced in intensity.

4,480,487

DEVICE FOR TESTING THE TENSION OF A DRIVING BELT DURING OPERATION

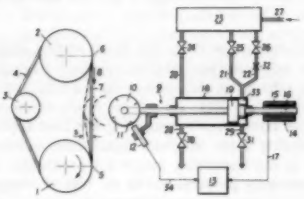
Wilhelm Kuazfeld, Graz, Austria, assignor to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnick, Graz, Austria

Filed May 6, 1983, Ser. No. 492,049

Claims priority, application Austria, May 12, 1982, 1873/82

Int. Cl.³ G01L *5/10*

U.S. Cl. 73—862.45 **2 Claims**



1. A device for testing the tension of a driving belt of an engine during operation, comprising two supporting points between which one strand of said belt is freely suspended, a loading mechanism being held such that it can move towards said strand, and a measuring unit for determining the deflection of said belt strand freely suspended between said supporting points, which occurs if a known force is applied by said loading mechanism and serving as a measurement variable, wherein one end of said loading mechanism adjacent to said belt strand to be loaded is provided with a measuring roller to be driven by said belt upon contact with it, said measuring unit comprising a pulse transducer and a device for measuring the distance travelled by said loading mechanism, said measuring roller is provided with pulse markers which, together with said pulse transducer, will deliver pulses indicating the rotation of said measuring roller to said measuring unit as soon as said roller moving towards said belt strand for measuring purposes is in contact with said belt, and wherein said distance measuring device is set to zero by means of said measuring unit as soon as said measuring roller starts to rotate, and the distance travelled after a given period of contact has elapsed, is used as a measurement variable.

4,480,488

FORCE SENSOR WITH A PIEZOELECTRIC FET

Eileen Read, and Daniel V. McCaughan, both of Buckinghamshire, England, assignors to The General Electric Company, P.l.c., England

Filed Feb. 16, 1983, Ser. No. 466,941

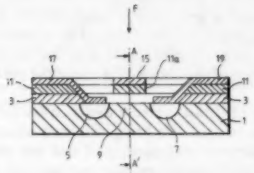
Claims priority, application United Kingdom, Feb. 19, 1982, 8204913

Int. Cl.³ G01L *1/16*

U.S. Cl. 73—862.68 **2 Claims**

1. A force sensor comprising: a field effect transistor structure comprising a semiconductor substrate including a source region, a drain region and a channel region between the source and drain regions; an insulating layer overlying said substrate adjacent to said channel region; a layer of a piezoelectric

material overlying said insulating layer and having a portion which extends beyond said insulating layer to overhang at least



a portion of said channel region; and a control electrode which overlies at least said portion of the piezoelectric layer.

4,480,489

CRANK MECHANISM IN A PUSHBUTTON TUNER

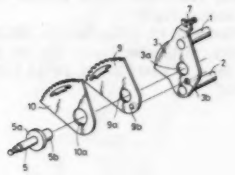
Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 327,980

Claims priority, application Japan, Dec. 12, 1980, 55-177588

Int. Cl.³ F16H *35/18*

U.S. Cl. 74—10.33 **2 Claims**



1. In a crank mechanism in a pushbutton tuner which comprises:

crank bars;

a side plate fixed to one end of said crank bars;

a crank gear located outward of said side plate;

a shaft supporting said crank gear and said side plate;

a backlash preventing gear mounted outward of said crank gear, said backlash preventing gear and said crank gear and said side plate being supported together by said shaft from opposite ends of said backlash preventing gear and said side plate;

said shaft comprising a small diameter portion inserted into shaft bores respectively formed in said side plate and said crank gear, a large diameter portion outwardly extending from said small diameter portion and inserted into a shaft bore formed in said backlash preventing gear and a flange formed outward of said large diameter portion, said small diameter portion being formed with an axial bore for receiving a caulking tool, a face connecting said large diameter portion to said small diameter portion of said shaft at one end of said small diameter portion, the opposite end of said small diameter portion being enlarged by a caulking deformation, said crank gear and said side plate being pivotally supported on said small diameter portion and closely sandwiched between said face and caulking deformation, said backlash preventing gear being pivotally supported on said large diameter portion and sandwiched snugly but relatively rotatably between said crank gear and said flange; and

means integral with said crank gear and side plate for positively preventing relative movement therebetween, said means including a protuberance formed on one of said crank gear and said side plate by deforming a part thereof, and a hole corresponding closely in size and shape to said protuberance and formed in the other of said crank gear and said side plate and snugly receiving said protuberance therein, thereby positively preventing said relative movement, said gears being mounted eccentrically on said shaft such that each gear has a radially long part carrying gear teeth on its periphery and a radially short part on the other side of said shaft from said gear teeth, the one of said protuberance and hole in said crank gear being in said radially short part thereof so as to be continuously overlaid by said booklash preventing gear regardless of the relative rotational position between said crank gear and backlash preventing gear, said protuberance and hole lying closely radially adjacent to the small diameter portion of said shaft.

4,480,490

MECHANICAL MEMBER

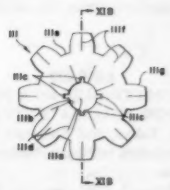
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Oct. 20, 1982, Ser. No. 435,490

Claims priority, application Japan, Oct. 22, 1981, 56-157449[U]; Oct. 22, 1981, 56-157448[U]; Nov. 17, 1981, 56-171150[U]; Nov. 30, 1981, 56-177958[U]; Dec. 18, 1981, 56-189097[U]; Dec. 26, 1981, 56-210958

Int. Cl.³ F16D *11/06, 51/00*

U.S. Cl. 74—401 **10 Claims**



1. A mechanical member comprising:

an inclined ring body having a substantially frustoconical profile and being substantially uniform in thickness in a direction parallel to the axis of the frustocone, said ring body comprising a stack of self-supporting and elastic, inclined ring elements having such a profile and uniformity in thickness, and each formed with a centrally located opening for slidably accepting therethrough a first member which is substantially cylindrical and an outer peripheral edge adapted for engagement with a second member, said ring elements each having a plurality of outer slits extending radially inwardly from said outer peripheral edge towards said centrally located opening and a plurality of inner slits extending radially outwardly from the edge defining said centrally located opening;

means for angularly orienting the elements of each stack with respect to one another, said means for angularly orienting said elements including an elongated formation on one of said members and formations on a corresponding edge of each of said elements engaging said elongated formation; and

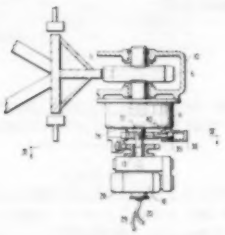
means carried by one of said first and second members so as to hold a bearing contact with said ring body and adapted to be displaced on said one member to change a given angle of said frustocone, thereby regulating the state of engagement of said ring body with said first and second members.

4,480,491

FORCE LIMITING GEAR REDUCER FOR LIFTING PINION OF SELF-ELEVATING PLATFORM

Francois Durand, Antibes, France, and Auguste Smulders, Geneva, Switzerland, assignors to Societe Anonyme Engrenages et Reducteurs, Velizy Villacoublay, France, a part interest

Filed Apr. 2, 1981, Ser. No. 250,145
Claims priority, application France, Nov. 10, 1980, 80 24386
Int. Cl.[3] F16H *57/00, 57/10, 1/04;* E02B *17/08*
U.S. Cl. 74—411 5 Claims



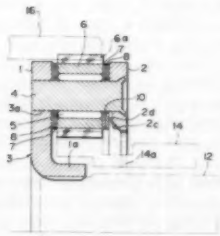
1. A force limiting gear reducer for a lifting pinion of a self-elevating platform, comprising a gear reducer divided in two parts, a first of said parts being directly connected to a pinion shaft and pinion support and a second said part comprising a shaft-mounted prime reducer with brake and motor connected to an input shaft of the first reducer, a reaction arm of the shaft-mounted prime reducer being connected to a fixed point of a jacking mechanism by means of at least one hydraulic cylinder, means to control the oil pressure in the hydraulic cylinder, and abutments limiting the stroke of the hydraulic cylinder.

4,480,492

LUBRICATION CONDUIT IN A PINION GEAR CARRIAGE FOR AUTOMATIC TRANSMISSION

Kazuyoshi Fujioka, Tokyo, and Shinsuke Eguchi, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 11, 1981, Ser. No. 329,809
Claims priority, application Japan, Dec. 19, 1980, 55-181785[U]; Dec. 19, 1980, 55-181786[U]
Int. Cl.[3] F16H *3/44, 57/04;* F01M *9/00;* F16C *1/24*
U.S. Cl. 74—467 4 Claims



1. A pinion gear carriage for a planetary gear mechanism having a rotatable central sun gear rotating differentially with respect to a central shaft and having a lubricant orifice said pinion gear carriage comprising:

(a) a first annular member having a central portion for engaging the central shaft;

(b) a second annular member secured to said first annular member to define therewith a carriage frame and having a central aperture for receiving said central shaft and said sun gear, an edge of the second annular member being positioned adjacent the central aperture to form a lubrication conduit for channeling lubricant flowing through said lubricant orifice;

(c) said carriage frame having at least one hole through which a pinion gear shaft is adapted to be disposed;

(d) a bearing adapted to be disposed between the pinion gear shaft and an associated pinion gear for allowing low-friction rotation of the pinion gear about the pinion gear shaft; and

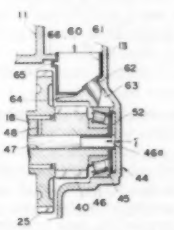
(e) two sets of thrust washers disposed on said pinion gear shaft, one of said sets being disposed adjacent said first annular member and another of said sets being disposed adjacent said second annular member to limit friction between said annular members and said pinion gear, each of said thrust washers having a central aperture including cutout portions arranged to provide overlap with respect to cutout portions of an adjacent thrust washers regardless of the rotational phase relationship therebetween thereby forming a lubrication passageway through each of said sets of thrust washers, said lubrication passageway communicating with said lubrication conduit to form a continuous passage between said sun gear and said bearing.

4,480,493

TRANSAXLE LUBRICATION SYSTEM

Kotei Takahashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 19, 1982, Ser. No. 350,384
Claims priority, application Japan, Feb. 20, 1981, 56-24766
Int. Cl.[3] F16H *57/04;* F01M *9/00*
U.S. Cl. 74—467 4 Claims



1. A transaxle comprising a housing charged with lube oil and having first and second housing sections; a transmission placed within said first housing section and including a pair of generally parallel first and second shafts having mounted thereon a gear train for transmitting motion between the shafts, said first shaft having movably mounted thereon a plurality of movable elements including gears forming part of said gear train and further having a lube oil passage for supplying therethrough lube oil to sliding portions of said movable elements; a final gearing and differential placed inside of said second housing section and coupled with said transmission to form a single unit, said final gearing having a ring gear plunged into the lube oil within said second housing, said second housing having at the inner wall thereof a boss portion on which said first shaft is journaled at an end thereof, said first shaft having adjacent said journal thereof a terminal end face which cooperates with said boss portion to define a chamber, said lube oil passage having an open end opening to said terminal end face of said first shaft, said boss portion having a through hole establishing communication between said chamber and the outside of said boss portion, a gutter-like projection provided on the inner wall of said second housing section to collect lube oil splashed and carried by said ring gear and constructed to descend slowly toward said boss portion so as to convey lube oil toward the boss portion, said gutter-like projection having a portion thereof extending at approximately the same elevational position as a

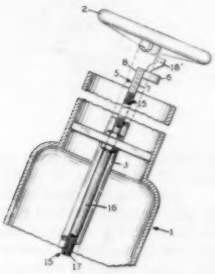
portion of the ring gear to overlap one of the sides of said ring gear to collect thereat lube oil sticking to said one side of the ring gear, and a funnel-like oil pocket member mounted on the inner wall of said second housing section at a location between said gutter-like projection and said boss portion, said oil pocket member having a storing portion for storing lube oil supplied thereto from said gutter-like projection and an outlet tube communicated with said storing portion and inserted into said through hole to introduce the lube oil from said storing portion to said chamber.

4,480,494

DEVICE TO TRANSLATE OSCILLATORY MOTION INTO RECIPROCATING MOTION

William J. Gilmore, Manitou Beach, Mich., assignor to Acco Babcock Inc., Fairfield, Conn.

Filed Dec. 17, 1982, Ser. No. 450,723
Int. Cl.³ B60K *20/06*
U.S. Cl. 74—473 SW **5 Claims**



1. A device to translate oscillating motion into reciprocating motion comprising a rigid tubular guide conduit having a first arcuate portion including a keyhole slot extending through a side wall of the conduit, a second straight portion extending substantially perpendicular to the plane of the arcuate portion and a third curved portion connecting the first and second portions, a flexible conduit connected at one end of said second portion opposite the curved portion, a flexible core member capable of transmitting tension and compression loads movable in said rigid guide and said flexible conduits, and a tab extension extending through said keyhole slot and being connected to an end of said core member whereby arcuate movement of said tab extension in said keyhole slot transforms a oscillatory motion of the end of the core member connected to said tab extension into a linear motion of the core member in the straight portion and in said flexible conduit.

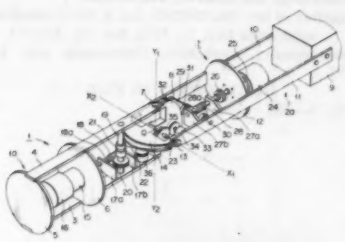
4,480,495

JOINT DEVICE

Masao Obama, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 15, 1982, Ser. No. 418,208
Claims priority, application Japan, Sep. 21, 1981, 56-147956
Int. Cl.³ F16H *37/06*
U.S. Cl. 74—479 **12 Claims**

3. A joint device having a plurality of support members provided with joint sections at their front and back ends and connected with one another at their front and back joint sections; wherein each of said joint sections has a rotating means attached to the support member, and a plate-shaped guide member rotatably attached to the support member by said rotating means, taking as its rotation axis a direction normal to the longitudinal direction of said support member and parallel to the face of said guide member, the adjacent support members are connected to each other with their guide members fixed keeping their rotation axes directed substantially perpendicular to each other, and a driving means for driving one of these guide members around the rotation axis of the other is



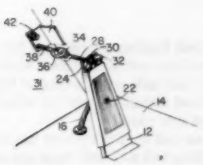
arranged on the support members adjacent to those to which said driven guide member is attached.

4,480,496

IDLE SPEED INCREASING APPARATUS

Sydney D. Marshall, 3714 Cummings Hwy., Chattanooga, Tenn. 37419

Filed Nov. 22, 1982, Ser. No. 443,201
Int. Cl.³ G05G *1/14*
U.S. Cl. 74—513 **14 Claims**



1. Apparatus for increasing the idle speed of a truck engine so that the engine may drive auxiliary equipment at sufficient speed while the truck is stationary, said truck having a driver compartment including a substantially planar accelerator pedal pivotably mounted about a pivot means on the floor of the driver compartment and extending upwardly from the pivot means for controlling the engine to operate at various speeds, the engine speed being increased when said pedal is pivotably depressed, said apparatus comprising, a jacket comprising a hollow sleeve received about at least an upper portion of said pedal, means for fastening said jacket to said pedal when the jacket is positioned thereon, coupling means fixed to said jacket remote from the pivot means when said jacket is positioned on said pedal, said coupling means comprising a plate including means defining a slot extending substantially normal to the plane of said pedal, an adjustment rod, means for pivotably carrying a first end of said rod from a wall of said driver compartment proximate said pedal at a disposition such that when operative said rod may be received within said slot with a second end of the rod extending through said slot, and when inoperative may be pivoted away from said pedal, abutment means disposed about said rod, said abutment means being larger than the smallest dimension of said slot, and adjustable fastening means securable on said rod more closely proximate said second end than said abutment means, whereby said abutment means may be disposed in abutting relationship intermediate said plate and said fastening means when said rod is in the operative position within said slot to pivotably depress said pedal as said fastening means is adjusted along said rod toward said first end.

4,480,497

BALL LOCKING MECHANISM

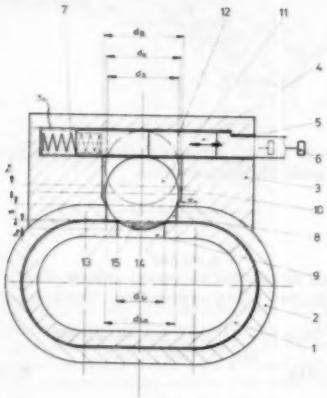
Hermann Locher, Dornach, Switzerland, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland

Continuation of Ser. No. 054,565, Jul. 2, 1979, abandoned. This application Dec. 21, 1981, Ser. No. 332,718

Claims priority, application Switzerland, Jul. 13, 1978, 7626/78

Int. Cl.[3] **G05G** *5/06*; **F16B** *7/14*

U.S. Cl. 74—531 **7 Claims**



1. A ball locking mechanism for the releasable locking of a first movable part at a second stationary part, comprising:

a first movable part having at least one bore;

a second stationary part at which there is guided said first movable part;

said second stationary part having a bore;

a locking ball movable between a locking position for releasably interlocking the first movable part and the second stationary part with one another and an unlocking position allowing for relative movement of said two parts with respect to one another;

said locking ball having a part thereof mounted in said bore of the second stationary part and, in the locking position of said locking ball, partially protruding into said bore of said first movable part;

a slide member provided for and slidably arranged within said second stationary part;

said slide member being located externally of said first movable part and within said second stationary part, both when said locking ball interlocks said first movable part and second stationary part with one another and when said locking ball is in said unlocking position allowing for relative movement of said two parts with respect to one another;

said slide member covering at least a portion of said bore of said second stationary part at an end situated opposite said bore of said first movable part;

said slide member including means into which there can only partially move said ball, during displacement of said slide member, for unlocking the first movable part when a pressure is exerted upon said ball which is effective transversely with respect to the lengthwise axis of the bore of the second stationary part;

said slide member coacting with said locking ball such that when said first movable part is under load the ball locking mechanism cannot be released;

said bore of said second stationary part being dimensioned such that at least a portion thereof is smaller than the diameter of said locking ball so that said locking ball cannot move out of said bore of said second stationary part in the direction of said first movable part and so that said first movable part is not unlocked until said means included in said slide member is coaxial with said bore of said second stationary part; and

said first movable part being completely detachable from said second stationary part without said locking ball moving out of said bore of said second stationary part in the direction of said first movable part.

4,480,498

GUIDE CONTROL ROD FOR WHEEL SUSPENSIONS OF MOTOR VEHICLES

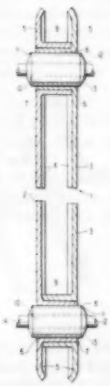
Werner König, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 219,372, Dec. 22, 1980,. This application Aug. 26, 1983, Ser. No. 527,193

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952176

Int. Cl.[3] **G05G** *1/00, 3/00*

U.S. Cl. 74—579 R **10 Claims**



1. A guide lever for wheel suspensions of motor vehicles comprising a lever body having two shaped parts constructed to be elongated and dish-shaped, the parts being firmly connected with one another, the lever body having integral guide socket means transversely penetrating the lever body near an end of the lever body forwhich purpose openings are arranged coaxially with respect to one another in the shaped parts, an edge of the openings being shaped into a ring collar, each of the two shaped parts including guide socket means having a ring collar of a larger diameter and guide socket means having a ring collar of a smaller diameter, said guide socket means being formed by ring collars arranged coaxially with respect to one another on the shaped parts and one ring collar being pressed into the other ring collar whereby the shaped parts are adapted to be forced or press fitted together.

4,480,499

DRIVING DEVICE FOR AUTOMOBILES

Seitoku Kubo; Koujiro Kuramochi, and Tatsuo Kyushima, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 31,778, Apr. 20, 1979, abandoned. This application May 11, 1981, Ser. No. 262,786

Claims priority, application Japan, Apr. 24, 1978, 53-49063

Int. Cl.[3] **F16H** *37/08*

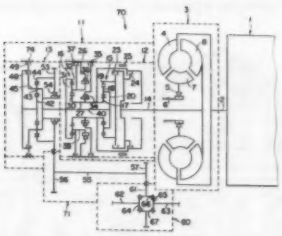
U.S. Cl. 74—695 **28 Claims**

1. A driving device for an automobile having an engine located proximate the driving wheels of said automobile, the axis of the crankshaft of said engine being parallel to the axles of said driving wheels, said driving device comprising:

a fluid-type torque converter drivingly connected to and coaxial with said engine crankshaft;

an auxiliary speed change gear assembly comprising at least first, second and third planetary gear units organically interconnected to provide four different speed ratios, said first and third planetary gear units being proximate and distal said torque converter, respectively, and one element of said third planetary gear unit being the output member of said gear assembly, said planetary gear units being driven by and coaxial with said torque converter, the axis of said gear assembly being substantially parallel to the axles of said wheels;

an output gear drivingly connected to said output member, said output gear being disposed between and coaxial with



said second and third planetary gear units and being drivingly connected by an axial spline fitting to said one element of said third planetary gear unit;

a transmission shaft mounted substantially parallel with the axis of said gear assembly and the axles of said wheels;

A driven gear secured to one end of said transmission shaft and drivingly meshed with said output gear;

a drive gear secured to the other end of said transmission shaft for rotation in a plane generally axially between said torque converter and said auxiliary speed change gear assembly; and

a differential gear disposed substantially centrally between said wheels proximate said torque converter drivingly connected with said drive gear for transmitting power from said gear assembly to the axles of said wheels.

4,480,500

GEAR NOISE SUPPRESSING TYPE FINAL GEAR TRAIN OF TRANSAXLE

Takahiro Yamamori, and Kazuyoshi Iwanaga, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 25, 1982, Ser. No. 342,248

Claims priority, application Japan, Feb. 9, 1981, 56-16955

Int. Cl.³ F16H *1/40, 57/02*

U.S. Cl. 74—713 **5 Claims**

1. A final gear train of a transaxle having a transmission, the transmission having a transmission case including a bell-shaped portion with a bottom portion and a bearing retainer attached to the transmission case in a spaced relationship with the bottom portion of the bell-shaped portion to form an integral part of the transmission case, the transmission also including an output gear,

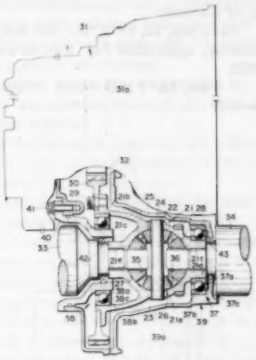
the final gear train comprising:

a final gear drivingly connected with the output gear;

a first bearing and a second bearing;

a differential case rotatably mounted to the transmission case within the bell-shaped portion via said first and second bearings, said differential case including a main body portion and a final gear attachment portion in the form of an axially extending generally annular portion extending axially from said main body portion, said final gear attachment portion having said final gear;

said main body portion of said differential case having mounted therein a pinion assembly including pinions rotatably carried by a pinion mate shaft fixed to said main body portion and side gears meshing said pinions and attached to a pair of axle shafts, respectively;



said first bearing being disposed between the final gear attachment portion and the bearing retainer of the transmission case, said first bearing being disposed inwardly of said final gear and in the same plane as that in which said final gear lies.

4,480,501

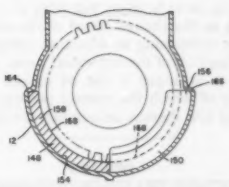
TRANSAXLE HAVING BEARING SHOES SUPPORTING A RING GEAR ASSEMBLY

Roland L. von Kaler, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jul. 6, 1982, Ser. No. 395,800

Int. Cl.³ F16H *1/38, 57/02*

U.S. Cl. 74—713 **9 Claims**



1. In a differential for a transmission including a housing, output shaft means journalled in said housing and having proximal ends, and a gear assembly coupling said proximal ends of said output shaft means together, a ring gear assembly comprising:

a ring gear having a plurality of teeth on its outer surface and connected to said gear assembly,

said housing having disposed therein a cavity formed to receive said ring gear and said gear assembly therein, and

bearing means radially disposed between said ring gear teeth and an inner surface of said cavity radially outwardly from said teeth, said bearing means including an annular inner bearing surface on which said ring gear teeth are directly supported against radial loads and movements.

4,480,502

HYDRO-MECHANICAL MULTIPLE-WHEEL DRIVE FOR SELF-DRIVING HEAVY VEHICLES

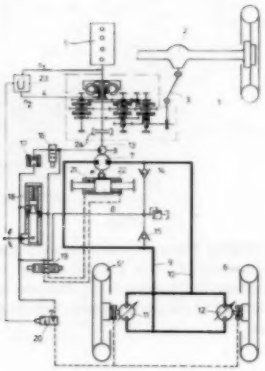
Siegfried Nembach, Immenstaad, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,750

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035522

Int. Cl.³ F16H 47/00, 37/06

U.S. Cl. 74—733 7 Claims



1. A hydrostatic-mechanical multiple-wheel drive for self-driving heavy vehicles comprising a multi-gear transmission arranged to drive main driving wheels of the vehicle, hydrostatically operable additional driving wheels, hydrostatic drive means, means for connecting said hydrostatic drive means to drive said additional wheels when desired, a variable displacement pump, adapted to be driven directly by and proportionally to the speed of a main drive motor, connected to drive said hydrostatic drive means, the displacement of said variable displacement pump being controlled by an adjusting valve biased to a null condition by opposed force means and an auxiliary pump, wherein, in order to control the speed with which the additional driving wheels are driven by the hydrostatic drive means relative to that of the main driving wheels, the auxiliary pump is connected to power a control arrangement for controlling the adjusting valve of the variable displacement pump, so as to adjust the valve to a control pressure corresponding to the desired speed of the additional driving wheels further comprising an adjusting throttle, which is adjustable as a function of the individual gears of the multi-gear transmissions, is arranged in the oil circuit of the auxiliary pump, by way of which the control pressure is adjusted between high and low thereby influencing the hydrostatic drive.

4,480,503

MULTISTAGE TRANSMISSION FOR MOTOR VEHICLES

Karl-Gustav Ahlen, and Per-Olof Bergstrom, both of Stockholm, Sweden, assignors to S.R.M. Hydromekanik Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 843,520, Oct. 19, 1977, abandoned. This application Jan. 15, 1981, Ser. No. 225,428

Claims priority, application United Kingdom, Aug. 25, 1977, 35697/77

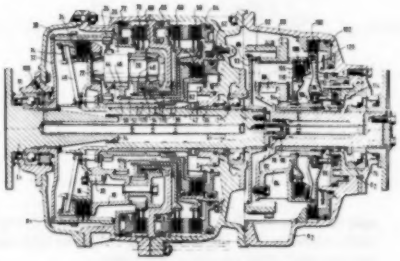
Int. Cl.³ F16H 57/10

U.S. Cl. 74—766 24 Claims

1. A multi-speed transmission comprising at least two planetary gear sets arranged in series with an output from a first gear set operatively connected to an input of the second gear set,

the first planetary gear set comprising a plurality of planetary pinions spaced around the axis of the first planetary gear set, each planetary pinion having at least three different gearing diameters, the input to the transmission operatively connected to a ring gear which is operatively engaged with the largest diameter gearing of the said planetary pinions, a carrier mounting said planetary pinions, the carrier being the output from said first planetary gear set, a separate sun gear operatively engaged with each of said gearing diameters, each of said sun gears having a brake for releasing its sun gear or braking it against rotation about its axis, a direct drive clutch for engaging the input ring gear with the output carrier,

the second planetary gear set having an input sun gear connected to the output of the first planetary gear set, a plurality of planetary pinions spaced around the axis of the second planetary gear set, said input sun gear connected to the said planetary pinions of the second planetary gear set,



a carrier mounting said planetary pinions of the second planetary gear set, said carrier being the output from said second planetary gear set, a direct drive clutch operatively engaging the said input sun gear with the output carrier for direct drive, a ring gear operatively engaged with the planetary pinions and having a brake for releasing the ring gear or preventing it from rotating about its axis for speed reduction through the second planetary gear set, the speed reduction ratio provided by braking the ring gear in the second planetary gear set being greater than the greatest speed reduction ratio provided by the first planetary gear set, such that braking the ring gear of the second planetary gear set moves the speed reduction ratios of the whole transmission to an entirely different range than those provided when the direct drive clutch of the second planetary gear set is engaged for direct drive therethrough.

4,480,504

SYSTEM FOR CONTROLLING TRANSMISSION RATIO OF TRANSMISSION FOR AUTOMOTIVE VEHICLES

Tomio Oguma, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 12, 1981, Ser. No. 263,006

Claims priority, application Japan, May 14, 1980, 55-63519

Int. Cl.³ B60K 41/04

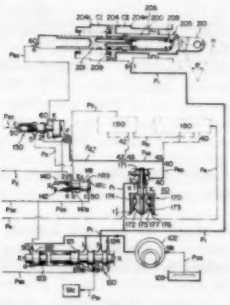
U.S. Cl. 74—868 18 Claims

1. A system for controlling a transmission ratio of an infinitely variable transmission for automatic vehicles including means for producing a line pressure, means for producing a pressure responsive to throttle opening, means for producing a pressure responsive to vehicle speed and means for changing said transmission ratio of said infinitely variable transmission, comprising:

compensation valve means for producing a transmission ratio control pressure, wherein said compensation valve means for producing said transmission ratio control pressure further comprises a spool regulated by said throttle opening responsive pressure and said vehicle speed responsive pressure such that said transmission ratio control

pressure increases when said vehicle speed responsive pressure is greater than said throttle opening responsive pressure and said transmission ratio control pressure decreases when said throttle opening responsive pressure is greater than said vehicle speed responsive pressure; and

a servo valve wherein said servo valve further comprises a cylinder; a spring-backed spool to which said transmission ratio control pressure is applied against a spring force; and an actuator axially slidable in said cylinder, said actuator



being operatively connected with said means for changing said transmission ratio and actuated by said line pressure and wherein said spring-backed spool further comprises control valve means for controlling said line pressure actuating said actuator such that said actuator slides in said cylinder so as to alternately cause a stepless increase and decrease in said transmission ratio in response to said transmission ratio control pressure applied to said spring-backed spool.

4,480,505

AUTOMATIC TRANSMISSION FOR FOUR WHEEL DRIVE AUTOMOTIVE VEHICLES

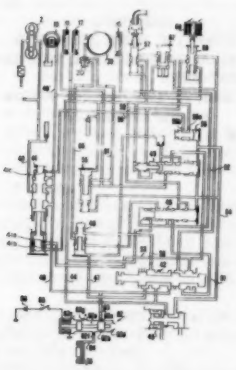
Toshio Takano, Hamuramachi, and Toshio Kobayashi, Koganei, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1980, Ser. No. 171,770

Claims priority, application Japan, Sep. 13, 1979, 54-117728

Int. Cl.³ B60K *41/18, 41/16;* F16H *37/06*

U.S. Cl. 74—869 **5 Claims**



1. An automatic transmission for an automotive vehicle having front wheels and rear wheels comprising

a torque converter connected to a crank shaft of an engine of said automotive vehicle,

an automatic transmission means connected to a turbine shaft of said torque converter, said automatic transmission means having a planetary gear and a plurality of fluid operated means for producing various operational ranges,

said automatic transmission means includes means comprising an oil pump operatively driven by the crank shaft of said engine for producing pressure,

a final reduction gear means for transmitting an output of said automatic transmission means to the front wheels of said automotive vehicle,

a fluid operated multiple-disk clutch means when actuated for operatively transmitting the output of said automatic transmission means to the rear wheels,

pressure oil control means for operating said fluid operated means in said automatic transmission means,

said pressure oil control means including: a pressure regulator valve means connected to said oil pump of said automatic transmission means downstream of the oil pump for regulating the pressure produced by said oil pump according to operational conditions of said engine so as to provide a regulated transmission line pressure for operation of said fluid operated means of said automatic transmission means; and an output conduit of said pressure regulator valve means having said transmission line pressure;

a changeover valve means when actuated for directly connecting said conduit for the transmission line pressure to said fluid operated multiple-disk clutch means,

a manual operating means for being manually operated for actuating said changeover valve means to apply the transmission line pressure to said fluid operated multiple-disk clutch means so as to actuate the latter, said fluid operated multiple-disk clutch means for its actuation being connected exclusively to said conduit and the transmission line pressure through said manual operating means,

said changeover valve means having a solenoid, and

said manual operating means comprising a manually operatable switch means, provided in a driver's area of the automotive vehicle, operatively connected to said solenoid, said switch means for operating the solenoid.

4,480,506

APPARATUS FOR GENERATING LOBULAR POLYGONAL FORMS

Eugene K. Chapman, South Dartmouth, Mass., assignor to Research Engineering & Manufacturing, New Bedford, Mass.

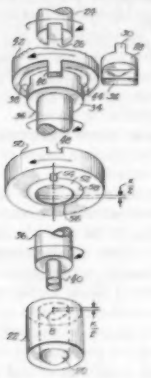
Continuation-in-part of Ser. No. 122,412, Feb. 19, 1980, abandoned. This application Oct. 15, 1981, Ser. No. 311,504

Int. Cl.³ B21K *5/20;* F16H *37/14*

U.S. Cl. 76—4 **5 Claims**

1. Apparatus for generating a lobular polygonal form comprising a first drive shaft, a tool holder, a universal coupling joining said first drive shaft and said tool holder, a tubular drive shaft surrounding said first drive shaft, a member driven by said tubular drive shaft and having a bore eccentric to the axis of said tubular drive shaft for receiving said tool holder so that said tool holder rotates in said bore and also orbits about

the axis of said tubular drive shaft to trace said polygonal form, and means providing a relative speed of rotation between said



tubular drive shaft and said first drive shaft that is a whole integer.

4,480,507

METHOD FOR MANUFACTURING A PUNCHING UNIT

Wilhelmus P. L. Boogers, Eindhoven, Netherlands, assignor to P.M.B. Patent Machinebouw, B.V., Best, Netherlands

Filed Feb. 22, 1982, Ser. No. 350,768

Claims priority, application Netherlands, Feb. 20, 1981, 8100858

Int. Cl.³ B21D *37/20*; A24B *7/00*

U.S. Cl. 76—107 C **3 Claims**

1. The method of manufacturing a cutting die assembly for tobacco leaf, which comprises the steps of:

(a) providing a die assembly having a supporting body having an opening of particular shape and a surrounding, generally horizontal planar margin over which tobacco leaf may be draped,

(b) bending knife blade strip to form at least one die cavity of said particular shape and with outer surfaces of the strip engaged against those portions of the supporting body defining said opening, said strip projecting slightly above said planar margin to define a die cutting edge parallel thereto,

(c) rigidifying said die cavity by filling same with a filling body within the die cavity to a height substantially below said die cutting edge,

(d) rigidly interconnecting the components of steps (a)–(c) by securement to a common carrier,

(e) providing a suction air chamber bounded by said carrier, said supporting body and said die cavity,

(f) providing openings through said margin to said suction air chamber whereby to hold tobacco leaf thereagainst and stretched over said cutting edge,

(g) providing a movable expelling plunger in said die cavity above said filling body but normally lying below said cutting edge, and

(h) providing suction air passages through said filling body and said plunger to hold tobacco leaf firmly on said cutting edge.

4,480,508

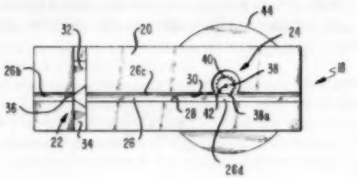
WIRE STRIPPER HAVING ROTARY DRIVING MEANS

Donald S. Rich, Long Valley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Apr. 16, 1982, Ser. No. 369,113

Int. Cl.³ H02G *1/12*

U.S. Cl. 81—9.5 R **19 Claims**



1. An apparatus for removing insulation from an insulated cable comprising:

a housing;

cutting means supported by said housing and including spaced insulation cutting surfaces defining an opening for receipt therein of said cable along a predetermined direction;

rotary drive means including a rotatable, generally cylindrical driving wheel supported by said housing and spaced from said cutting means, said driving wheel adapted to engage a portion of said cable and pull said cable portion away from said cutting means during rotation thereof;

said housing having an elongate cable receiving channel communicating with said cutting means and with said driving wheel, said channel including opposing wall surfaces spaced apart a distance to accommodate said cable with relatively close clearance, said driving wheel being rotatable about an axis disposed transversely to said channel and offset relative thereto; and

means inclusive of a flat portion on said driving wheel extending axially therealong providing for substantially non-interfering insertion of said cable into said rotary drive means simultaneously with insertion of said cable into said cutting means along a direction common to the direction of cable insertion into said opening of said cutting surfaces, said flat portion being, upon rotation of said driving wheel, periodically aligned substantially coplanarly with one of said wall surfaces of said channel.

4,480,509

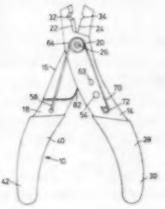
AUTOMATIC WIRE STRIPPER

Meinul H. Hydary, 25A Milton St., Apt. #1B, Etobicoke, Ontario, Canada M8Y 2X7

Filed Mar. 25, 1983, Ser. No. 478,966

Int. Cl.³ H02G *1/12*

U.S. Cl. 81—9.5 A **14 Claims**



1. A wire stripping tool for removing insulation from the end

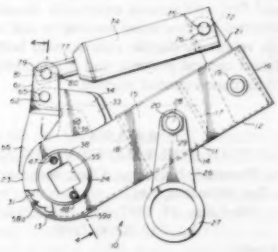
of electrical wiring comprising a first, elongate cutting member providing a first handle at one end and a first cutting edge at the opposite end thereof, said cutting edge including a wire-receiving notch; a second cutting member providing a second cutting edge having a wire-receiving notch therein; an elongate insulation removing member having a second handle at one end and an insulation pulling edge at the opposite end thereof; means for pivotally connecting together at a single location close to said cutting edges said first and second cutting members and said insulation removing member; stop means for preventing continued pivotal movement of said first cutting member relative to said second cutting member beyond a selected point; and spring means connected at one end to said insulation removing member and at the opposite end to said second cutting member, said spring means acting to bias said insulation removing member to a position where said pulling edge is beside said second cutting edge, wherein the pulling of said handles towards one another initially closes the cutting edges to cut insulation near the end of a piece of electrical wiring, said stop means and said notches preventing the electrical wire or wires in said wiring from being cut, and continued pulling of said handles towards one another draws the severed end of the insulation off the wire or wires to expose the latter.

4,480,510

POWERED RATCHET WRENCH

Thomas Aparicio, Jr.; Dave D. Nagel, both of Houston, Tex., and Ron Graham, Norco, Calif., assignors to Gratec, Inc., Norco, Calif.

Filed Sep. 28, 1981, Ser. No. 306,089
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—57.39 **3 Claims**



1. A powered ratchet wrench for turning threaded members comprising

an elongated, box-shaped supporting housing with an open end having spaced parallel side plates with aligned circular openings therein,

a pair of supporting plates positioned in said housing opening adjacent to said side plates, secured together in spaced parallel relation and having holes of the same size as and aligned with said circular openings,

a ratchet wheel having a non-circular hole therethrough adapted to receive a drive shaft for a wrench to be operated thereby and supported for rotation in said circular housing openings,

removable bearing members positioned in said circular openings operatively supporting said ratchet wheel and said supporting plates and providing bearing surfaces for movement of said ratchet wheel in said circular openings and of said supporting plates relative to said ratchet wheel,

a first pawl having a bifurcated yoke at the top with a curved pawl surface with teeth in the lower end thereof fitting the teeth of said ratchet wheel,

said supporting plates being pivotally connected to said pawl inside said yoke with a portion of said yoke extending beyond said pivoted connection,

a second pawl in the shape of a substantially 90° bent arm fitting around said ratchet wheel and having teeth in the lower end thereof positioned to engage the ratchet teeth in driving relation thereto and pivotally connected inside said yoke to said frst pawl and said supporting plates,

a spring operatively connected to said pawls urging the same into engagement with said ratchet wheel teeth,

said pawl teeth being engagable with the teeth of said ratchet wheel on opposite sides thereof and fitting said ratchet wheel teeth for driving said wheel upon movement in one direction and for having a ratcheting function relative to said wheel upon movement in the opposite direction,

a retaining pawl comprising a spring member supported on said housing and engageable with said ratchet wheel and permitting rotation thereof in said one direction and restraining the same from rotation in said opposite direction,

a double acting, fluid pressure operated cylinder and operating piston extending therefrom, secured on said supporting housing,

said operating piston being connected to said yoke extension for moving said pawls and said supporting plates together to rotate said ratchet wheel, and

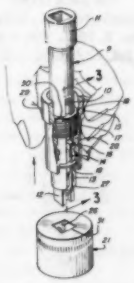
a reaction arm secured on said housing having a supporting ring for positioning over a fixed projection near the threaded member to be turned by the wrench.

4,480,511

LOCKING SOCKET WRENCH DRIVE DEVICE

Michael F. Nickipuck, 4525 S. DuBois, Brookfield, Ill. 60513

Filed May 4, 1981, Ser. No. 260,350
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—177 G **1 Claim**



1. In a socket wrench drive extension, a shank with driving and driven means at opposite ends; a release control sleeve incorporating inner control bar engagement means, a helical coil spring carried external of the shank and internal of the sleeve said sleeve forced downward by said helical spring into a positive locking position, said sleeve being displaced upwardly by the action of a user in the direction opposite from the direction in which the socket is moved to remove it from the tool; a longitudinally extending control bar channel machined into the surface of the shank of the socket wrench drive extension; a control bar slidably mounted in said control bar channel with sleeve engagement means, a beveled release surface on the lower end of the control bar, an inner locking surface contiguious to said beveled release surface and a flat outer positive locking and centering portion on the opposite face of the control bar from said inner locking surface, said control bar outer positive locking and centering portion performing a flat plane in conjunction with one driving face of the square driving portion of the socket wrench drive extension; a transverse bore through the shank intersecting the control bar channel at approximately 90° thereto and extending completely through the driving portion of the socket wrench drive extension to the opposite face; a retainer ball slidably carried in

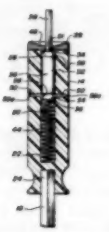
said transverse bore; a locking bearing ball transmitting force from the control bar release surface through force transmission means, force transmission means slidably carried in the transverse bore between said retainer ball and said locking bearing ball to outwardly displace the retainer ball; said retainer ball extending beyond the face of the driving portion of the socket wrench drive extension opposite the face which forms flat plane in conjunction with the outer positive locking and centering portion of the control bar, said retainer ball extension through the driving face sufficient to engage in a standard recession machined on the inner driven walls of standard fastener drive sockets, said retainer ball further transmitting force exerted downward on standard fastener drive sockets and on said retainer ball respectively, horizontally evenly through the locking mechanism to the control bar and thence providing equalized lateral forces on the opposite drive inner faces of a standard square drive fastener driving socket, said equalized forces providing for a centering action in oversized and worn sockets and therefore, equalizing stresses caused by the application of tensional forces through the drive mechanism to the socket.

4,480,512

SCREWDRIVER FOR MANUAL OR POWER OPERATION

Yigal Y. Yaari, 47 Leamington Rd., Brighton, Mass. 02135

Filed Dec. 5, 1983, Ser. No. 558,098
Int. Cl.³ B25G *1/00*
U.S. Cl. 81—436 **14 Claims**



1. A screwdriver having a retractable coupling enabling it to be operated manually in the conventional manner or be coupled to a power drill to be operated by it comprising

a shank having a tip at one end for engaging the head of a screw

a handle permanently fixed to the other end of the shank enabling the screwdriver to be gripped conventionally for conventional manual operation,

a chamber in the handle open at the end of the handle away from the shank,

a coupling slidable in the chamber between first and second positions, said coupling having a first portion which extends a substantial distance out of the chamber when the coupling is in the first position and being substantially confined within the chamber when the coupling is in the second position,

said first portion being shaped so that it may be engaged by a drill chuck,

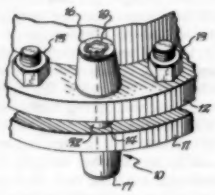
and means for rotatably connecting the handle and coupling together.

4,480,513

BOLT-LOCK STRUCTURE

Lewis D. McCauley, Eggertsville, and John H. Taylor, Orchard Park, both of N.Y., assignors to McGard, Inc., Buffalo, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,186
Int. Cl.³ B25B *13/48*
U.S. Cl. 81—436 **16 Claims**



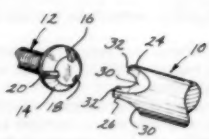
1. In a structure having a pair of flanges with a space therebetween with aligned holes in said flanges, a locking bolt structure extending through said aligned holes comprising an elongated bolt member, first and second externally threaded ends on said elongated bolt member, first and second nuts of solid of revolution configuration, first and second internally threaded bores on said first and second nuts, respectively, for mating engagement with said first and second externally threaded ends, respectively, first and second outer faces on said first and second nuts, respectively, first and second key-receiving depressions of curved endless configuration in said first and second faces, respectively, for receiving mating key members for selectively tightening and loosening said nuts, a hardened central portion on said elongated bolt member intermediate said first and second externally threaded ends, said hardened central portion being located in said space between said flanges, relatively ductile ends on said bolt member outwardly of said central portion, and a relatively ductile core within said hardened central portion.

4,480,514

DRIVING TOOL FOR TAMPER RESISTANT SCREW

Louis Fiore Ponziani, Kettering, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 17, 1982, Ser. No. 389,264
Int. Cl.³ B25B *23/00*
U.S. Cl. 81—461 **5 Claims**



1. A tool for driving a tamper resistant screw having a conical head provided with three equiangularly spaced slots extending longitudinally along the surface of the conical head, comprising:

(a) a body having a bit end and defining a longitudinal axis,

(b) said bit end including three equiangularly spaced tangs separated from each other by a central recess, the recess thereof adapted to receive the conical head of the tamper resistant screw;

(c) each said tangs having substantially planar, parallel side walls engageable with the side walls of the slots of the screw, pairs of substantially planar, parallel side walls on adjacent said tangs defining portions of an inwardly curved surface;

(d) each said tangs having a generally inwardly facing surface defining a portion of a frustum of a cone, said surfaces

disposed at a smaller acute angle to said axis and merging into a generally conical surface disposed at a larger acute angle to said axis, and

(e) said bit end having a diameter no larger than the base diameter of the conical end of the tamper resistant screw whereby said tangs are visible for engagement with the slots in the head of the tamper resistant screw allowing the head to be installed within a similarly sized counterbore.

4,480,515

ARTICLE EJECTION APPARATUS

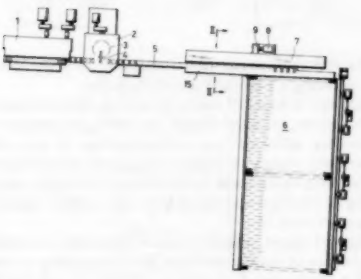
Theodor Zacharias, Meerbusch; Hans D. Gerhards, Solingen-Gräfrath, and Karlhans Staat, Homberg, all of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Continuation of Ser. No. 190,227, Sep. 24, 1980, abandoned. This application May 20, 1983, Ser. No. 496,388

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1979, 2940761

Int. Cl.³ B26D *7/18*

U.S. Cl. 83—81 **9 Claims**



1. Apparatus for the laterial ejection of elongate lengths of articles such as pipe out of a channel defined by a roller bed or the like, the channel extending beyond a severing device adapted to sever material into said lengths while moving in the lengthwise direction, the apparatus comprising means engaging said elongate lengths to move them transverse to their length out of said channel, drive means driving said engaging means and actuating means responsive to operation of said severing device for initiating operation of the drive means after the termination of each severing operation, said actuating means including a pulse generator fitted to the severing device and delivering a start signal to the drive means at the end of each severing apparatus and a delay device between the pulse generator and drive means for delaying operation of the drive means by an optional amount.

4,480,516

MACHINE FOR CONTINUOUSLY CUTTING A STRIP FOR FORMING SECTIONS WITH ROUNDED EDGES HAVING OPPOSITE CURVATURES

Louis Leroy, Creteil, France, assignor to Etablissements Ruby, Voiron, France

Filed Nov. 18, 1981, Ser. No. 322,433

Claims priority, application France, Nov. 19, 1980, 80 24539

Int. Cl.³ B26D *7/06*

U.S. Cl. 83—98 **15 Claims**

1. A machine for cutting a continuous strip which is movable in horizontal translation,

said machine being adapted to form from the strip cut sections characterized in being bounded by rounded cut edges which opposite convexities,

such machine comprising, in sequence, along the direction of translation of the strip:

(a) first rotary cutter means including:

(i) a first cylindrical cutter carrier;

(ii) a first cutter at the surface of said first cutter carrier, said first cutter having an edge which has a rounded outline;

(iii) a first counter roller rotatable so as to be tangential to the said cutter edge;

(iv) an arbor to said first cylindrical cutter carrier;

(v) an arbor to said first counter roller;

said arbors being fixed in position, parallel and arranged one above the other; and

(vi) means rotating said arbors in opposite directions to give the cutter edge and the counter roller a linear displacement velocity equal to that of the strip;

(b) first conveyor means operative to convey a strip section cut by said first rotary cutter means to impart a higher linear velocity than that of the strip when the cut has been effected;

(c) second rotary cutter means including:

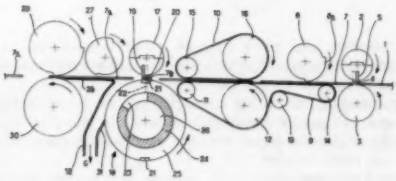
(i) a second cylindrical cutter carrier;

(ii) a second cutter carried peripherally by said second carrier;

(iii) a second counter roller;

(vi) an arbor to said second cylindrical cutter carrier;

(v) an arbor to said second counter roller;



(vi) means effective to rotate said arbors in opposite directions to give the second cutter and the second counter roller a linear displacement velocity equal to that of the strip section being cut by said second rotary cutter means;

said second cutter forming an edge with a rounded outline whose convexity is, at the moment of cut, opposite to that of said first cutter of the first rotary cutter means;

said arbors of the second cylindrical cutter carrier and of the second counter roller being fixed in position, parallel and arranged one above the other;

the second counter roller being tangential to the cutting edge of said second cutter; and

(vii) suction means to said second counter roller effective to apply suction just ahead of the said cutter edge where said second cutter is tangent to said second counter roller in order to keep the off-cut on the second counter roller;

said suction means being arranged to cut off the application of suction after rotation of the counter roller and off-cut through a fraction of a revolution to allow the said off-cut to be removed from said second counter roller; and

(d) second conveyor means imparting a linear velocity to the cut section leaving

said second rotary cutting means higher than that of the cut section arriving at said second rotary cutting means.

4,480,517

BACK-SPLITTING APPARATUS FOR USE IN PRODUCTION OF BOOKS

Eiji Miyamoto, Kanaza, Japan, assignor to Marumiya Shoko Co., Ltd., Japan

Filed Jul. 13, 1982, Ser. No. 397,694

Claims priority, application Japan, Jul. 15, 1981, 56-110579

Int. Cl.³ B26D *5/34*

U.S. Cl. 83—210 **5 Claims**

1. Back-splitting apparatus for use in the production of books comprising:

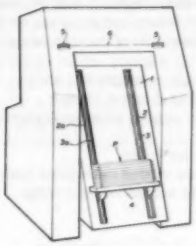
a feeding mechanism having a back-splitting station and operable to feed a block of stacked sheets of paper, bound

together on at least one side and having an adjacent side and constituting a plurality of books to the back-splitting station, each of said books having a plurality of sheets,

a plurality of projection piece provided along said adjacent side of the final sheets of the respective books of the block,

a suction member disposed at a position corresponding to one of said projection pieces with said block positioned in alignment with the back-splitting station of said feeding mechanism and operable to draw a projection piece toward the suction member,

a pawl member movable to the lower portion of said suction



member, said pawl member being constructed to be moved below said suction member and a projection piece adjacent said suction member,

an operating mechanism connected to said suction member and said pawl member and operating to interpose one of the projection pieces between said suction member and said pawl member, and

a back-splitting cutter knife operable to move into the back surface side adjacent said projection piece interposed between said suction member and said pawl member for separating the block of stacked sheets of paper into an individual book.

4,480,518

APPARATUS FOR TRIMMING THE MARGINAL PORTIONS OF PAPER SHEETS OR THE LIKE

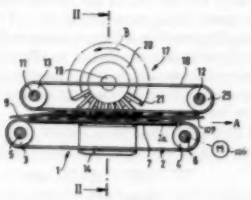
Klaus-Jürgen Futterer, Ostfildern, Fed. Rep. of Germany, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Jun. 18, 1982, Ser. No. 389,982

Claims priority, application Switzerland, Jul. 15, 1981, 4632/81

Int. Cl.³ B26D *1/20*

U.S. Cl. 83—508 **11 Claims**



1. Apparatus for trimming lateral marginal portions of piles of paper sheets which form a scalloped stream, comprising a transporting unit arranged to advance a succession of sheets along a predetermined path and defining a cutting plane in a predetermined portion of said path; and severing means including at least one counterknife adjacent to one side of said path and having a cutting portion in the region of said plane, a rotary knife holder at the other side of said path opposite said counterknife, and at least one knife extending substantially radially of said holder and having a cutting edge arranged to orbit along an endless path a portion of which extends beyond said plane and to said one side of said predetermined path, said cutting edge and said plane making an angle of 0°–15° when said cutting edge reaches said plane and an angle of 15°–45° when at least a portion of said cutting edge extends to a maximum extent to said other side of said predetermined path.

4,480,519

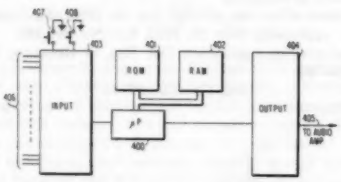
MUSICAL INSTRUMENT WITH IMPROVED KEYBOARD

Maria R. Allen, Washington, D.C., assignor to Yolanda M. Arellano, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 429,364

Int. Cl.³ G10H *1/22*

U.S. Cl. 84—1.01 **10 Claims**



1. An improved sound selection device for a musical instrument including a keyboard and comprising:

a plurality of keys, all said keys with an upper surface lying in a plane, of equal length and arranged parallel to one another, different keys corresponding to and selecting different sounds for production, groups of said keys corresponding to different octaves, each of said groups including an identical number of keys, said number significantly greater than 12;

command means responsive to simultaneous selection of a plurality of contiguous keys for commanding production of a single sound selected in relation to said contiguous keys.

4,480,520

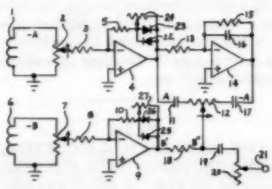
ELECTRONIC AUDIO BLENDING SYSTEM

Kenneth S. Gold, 7721 Nevada Ave., Canoga Park, Calif. 91304

Filed Jan. 24, 1983, Ser. No. 460,281

Int. Cl.³ G10H *1/08, 3/18*

U.S. Cl. 84—1.16 **9 Claims**



1. In an electric guitar having at least a first pickup and a second pickup, each capable of producing electrical signal output, a circuit for blending the signal outputs from each of the two pickups and for controlling the proportions of the blending, comprising:

(a) a blend potentiometer having at least a first end terminal, a rotor terminal and a second end terminal;

(b) means for applying a signal derived from the first pickup to the first end terminal;

(c) means for applying a signal derived from the first pickup to the second end terminal in phase opposition to the signal applied to the first end terminal;

(d) means for conductivity coupling a signal derived from the second pickup to the rotor terminal;

whereby an output signal derived at the rotor terminal contains

over a first half of its range, a variable blend of signal derived from the first pickup and signal derived from the second pickup, substantially in phase with each other, and

over a second half of its range, a variable blend of signal derived from the first pickup and signal derived from the second pickup, substantially out of phase with each other.

4,480,521

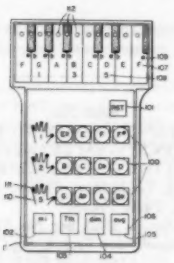
SYSTEM AND METHOD FOR INSTRUCTION IN THE OPERATION OF A KEYBOARD MUSICAL INSTRUMENT

Arthur R. Schmoyer, Capital Yacht Club, 600 Water St. SW., Washington, D.C. 20022

Continuation-in-part of Ser. No. 277,612, Jun. 24, 1981,. This application Aug. 3, 1982, Ser. No. 404,895

Int. Cl.³ G09B *15/08*; G10G *3/04*; G10H *7/00*

U.S. Cl. 84—1.28 **6 Claims**



1. A study aid method for teaching self instruction in the makeup of musical chord triads comprising the steps of:

providing at least one display including a visual representation of a musical instrument keyboard, the keyboard having a plurality of keys and each of the keys having a visual indicator and a numeric display;

providing a plurality of manual switches, each of which corresponds to a respective major chord triad;

wherein, when one of the major chord manual switches is depressed, a numeric display for the three keys corresponding to the selected major chord triad are illuminated and a visual indicator corresponding to the depressed major chord manual switch is illuminated, whereby the proper fingering of the selected major chord triad can be immediately ascertained.

4,480,522

ROCKET EXHAUST-GAS DEFLECTOR

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Oct. 15, 1981, Ser. No. 311,488

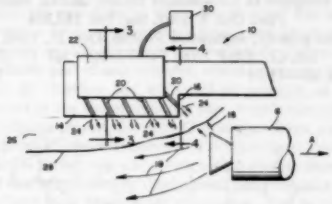
Int. Cl.³ F41F *3/04*

U.S. Cl. 89—1.819 **20 Claims**

1. A method of shielding a member normally exposed to rocket exhaust during launching of a missile comprising the steps of:

providing a plurality of gas jet orifices distributed over the exterior surface of said member;

selectively applying pressurized gas to said orifices to develop a protective plane over said surface; and



limiting the time duration of said protective plane in accordance with the passage of the rocket exhaust adjacent said surface.

4,480,523

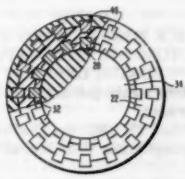
ELECTROMAGNETIC PROJECTILE LAUNCHING SYSTEM WITH A CONCENTRIC RAIL GEOMETRY

Frederick J. Young, State College; William F. Hughes, Cambridge Springs; Daniel W. Deis, Churchill Borough, and Ian R. McNab, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 6, 1981, Ser. No. 319,029

Int. Cl.³ F41F *1/00*

U.S. Cl. 89—8 **24 Claims**



12. An electromagnetic projectile launching system comprising:

a pair of cylindrical coaxial conductive electrodes;

an annular conductive armature disposed between said electrodes and in sliding electrical contact with said electrodes;

a plurality of axial slots in the inner one of said pair of electrodes;

a central plug slidably disposed within the inner one of said pair of electrodes;

a plurality of insulating support arms which pass through said slots and rigidly attach said armature to said central plug;

a plurality of insulating support rails running axially between said electrodes, which support the segments of the inner one of said electrodes created by said slots;

a plurality of apertures in said armature through which said support rails pass;

a source of current; and

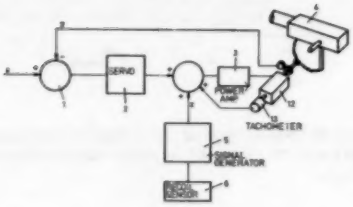
a commutating means for connecting said current to said electrodes, wherein current flowing longitudinally within said electrodes and through said armature produces magnetic fields which propel said armature along said electrodes.

4,480,524

MEANS FOR REDUCING GUN FIRING DISPERSION

Ake Blomqvist, and Roland Forsgren, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 9, 1981, Ser. No. 310,334
Claims priority, application Sweden, Oct. 27, 1980, 8007529
Int. Cl.[3] F41F *1/00;* F41G *3/00;* F16F *15/02*
U.S. Cl. 89—41 M 10 Claims



1. In a weapon system having a servo system for aiming a gun at a target, said gun position controlled in response to a position error signal of said servo system, apparatus for reducing oscillation of said gun which results from firing inducing a firing dispersion of said gun, comprising:

signal generator means for generating at the time of firing said gun a signal which reduces the amplitude of said error signal produced from said firing whereby said oscillations are reduced;

means for sensing the firing of said gun; and

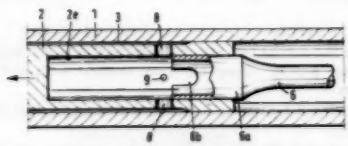
means for applying said signal to said servo system in response to firing said gun, whereby a servo error signal which produces said gun oscillations is reduced.

4,480,525

CONTROL DEVICE FOR FORWARD AND BACKWARD TRAVEL OF AUTOMATIC PNEUMATIC PERCUSSION BORING DEVICES

Gustav Jenne, Schmachtenbergstrasse 183, 43 Essen-Kettwich, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,060
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104547
Int. Cl.[3] F15B *15/22;* F01L *21/02;* F01B *7/18*
U.S. Cl. 91—25 10 Claims



1. In a control device for two working cycles of forward movement and rearward movement respectively of a self-propelled pneumatic ram boring device with an impact piston which is axially displaceable forwardly and rearwardly in a control stroke between two abutments, respectively impacting one of the abutments in each working cycle, in a generally tubular-shaped housing, whereby the axial forward movement and rearward movement of the ram boring device is controllable by control edges of a control sleeve, the latter being supported non-displaceably in the axial direction however rotatably on a bearing ring arranged in a rear part of the tubular-shaped housing, said control sleeve being connected to a compressed air hose and through which compressed air is fed to the impact piston driving the latter in its axially displaceable forward and rearward movement, and which sleeve has at its front end a piston-shaped control head containing the control edges, the control head engaging in a cylindrical recess at a rear end of the impact piston cooperates with at least one radial control opening which is formed in the impact piston in the vicinity of the recess, the control edges forming two different types of pairs of the control edges, each of said pairs having a front said control edge and a rear said control edge, said two different types of pairs being offset in the peripheral direction as well as in the axial direction relative to each other such that respectively in one rotated position of said control sleeve during operation of the ram boring device in each one of the two working cycles, respectively, only one of said two different type of pairs of the control edges is aligned cooperating with the control opening and the other of the two different type of pairs is not aligned with and does not cooperate with the control opening, and said impact piston being guided non-rotatably in the housing, the improvement wherein

said control opening constitutes a main control opening,

said impact piston is formed with at least one additional control opening which cooperates with said other pair of the control edges,

said at least one additional control opening has a flow cross-section considerably smaller than that of the main control opening, and

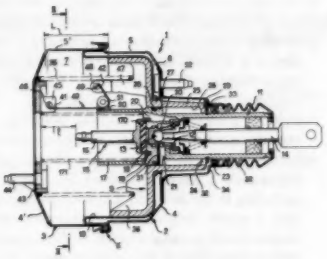
the rear control edges of both said pairs are formed in common by a rear circumferential edge of said control head.

4,480,526

BRAKING ASSISTANCE SERVOMOTOR WITH A FORCE AMPLIFICATION SYSTEM BETWEEN THE PISTON AND THE OUTPUT MEMBER

Jean-Jacques Carré, Le Raincy, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Sep. 2, 1983, Ser. No. 529,174
Claims priority, application France, Sep. 30, 1982, 82 16451
Int. Cl.[3] F15B *9/10;* F01B *9/00*
U.S. Cl. 91—374 13 Claims



1. A braking assistance servomotor which comprises a casing, an assistance piston assembly displaceable in the casing and dividing the casing into two chambers, an output member actuatable by the piston assembly, an input member, and an articulated force amplification system connecting the piston assembly to the output member, characterized in that the force amplification system comprises at least one flexible elongate member having opposite ends fixed to the piston assembly and to the casing, respectively, and turned by partially folding back around a return component connected to a valve sleeve cooperating with the output member, valve means being arranged in said valve sleeve which forms fluid distribution passages connecting respectively said valve means and said chambers of the casing, and through which said input member extends axially, said piston assembly incorporating a tubular hub sliding on said valve sleeve.

4,480,527

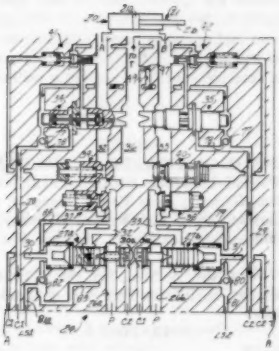
POWER TRANSMISSION

Kurt R. Lonnemo, Bloomfield Hills, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Continuation of Ser. No. 117,936, Feb. 4, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,554

Int. Cl.³ F15B *11/08, 13/042*

U.S. Cl. 91—436 8 Claims



1. A hydraulic control system for use with a hydraulic actuator having a movable actuator element and a pair of actuator openings adapted to function alternately as inlets and outlets for moving the actuator element in opposite directions, a pilot controller for controlling a supply of fluid at pilot pressure, a reservoir tank, and a pump for supplying fluid from the tank at pump pressure to the actuator openings, the system comprising:

a supply line adapted for connection with each of the actuator openings and the pump;

a tank line adapted for connection with a tank;

a meter-out valve interposed between each of said supply lines and said tank line for metering fluid flow between said supply and tank lines, each of said meter-out valves being selectively pilot operated by pilot pressure;

a pair of meter-in valves each positioned in one of said supply lines, said meter-in valves adapted for metering fluid flow through one or both of said supply lines, each of said meter-in valves being operable independently of the other by pilot pressure;

a load-drop check valve in each of said supply lines in series relationship with said meter-in valves, each said load drop check valve including a chamber means with fluid therein acting to close the valve; and

means for simultaneously opening both of said meter-in valves,

said means for simultaneously opening said meter-in valves including means for venting the chamber of one of said load-drop check valves to effect the opening thereof whereby the said supply lines communicate with one another.

4,480,528

TRIGGER VALVE FOR PNEUMATIC NAILING MACHINE

Tadayoshi Shiroyama, 4150 Midorigaoko, Honmachi Uenoshi, Mieken, Uenokojo, Japan

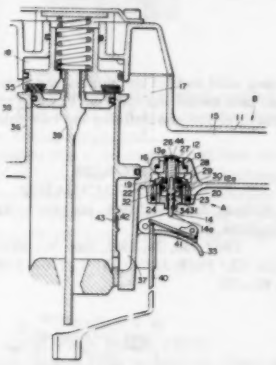
Filed Jul. 21, 1983, Ser. No. 515,691

Claims priority, application Japan, Oct. 26, 1982, 57/187927

Int. Cl.³ F15B *13/042*

U.S. Cl. 91—461 1 Claim

1. A trigger valve for a pneumatic nailing machine comprising: a head valve which is provided in a passage between a main air chamber and a main cylinder in which a driver piston reciprocates, and which opens and closes said passage; a trigger valve which is incorporated in an air passage communicating with a chamber above said head valve and with said main air chamber, said trigger valve forming a trigger valve cylinder comprising two cylinder parts that divide it into an upper portion and a lower portion said upper and lower portions being closely joined together; a lateral hole formed in the upper cylinder part of said cylinder, which communicates with said main air chamber and with said air passage; an exhaust hole formed in the lower cylinder part, which communicates with the atmosphere on the side of the trigger lever; a cylindrical trigger pilot valve stem provided in the trigger valve cylinder, which is slidable up and down within a range bounded by top dead center and bottom dead center; first, second and third O-rings fitted onto said trigger pilot valve stem to open said



lateral hole and said main air chamber when said stem is located at top dead center and to close said lateral hole and said exhaust hole when said stem is located at bottom dead center; a small-diameter communication hole formed in an upper closed surface of said trigger pilot valve stem, which communicates with a hollow portion in said stem and with said main air chamber; a pilot air chamber which is formed in said lower cylinder part and which communicates with said main air chamber via said small-diameter communication hole; a trigger valve stem provided in the lower cylinder part, which is slidable in the hollow portion formed in said trigger pilot valve stem; and fourth and fifth O-rings which are fitted onto said trigger valve stem to open and close said small-diameter communication hole and said pilot air chamber.

4,480,529

AXIAL PISTON PUMP

Ottmar Winkler, Schweinfurt, and Egon Pfaller, Dittelbrunn, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,206

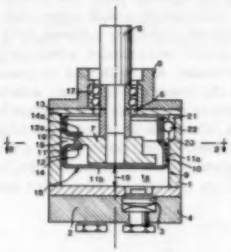
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030285

Int. Cl.³ F01B *3/04*

U.S. Cl. 92—31 13 Claims

1. A piston pump assembly comprising a housing, a single unitary piston member mounted for axial movement in a bore of the housing forming a piston chamber, and arranged coaxially relative to a drive shaft, said piston comprising a thin-walled member of generally cup-shaped configuration, cam means associated with said drive shaft disposed in the bore of said cup-shaped piston and cam follower means associated with said piston operatively connected to said cam means whereby rotation of said shaft effects through said cam and cam follower means axial back-and-forth movement of said piston in said housing bore, said piston including a hollow tubular body section and a pair of thin-walled sleeves axially arranged next to each other in the bore of the body section and

wherein each of said sleeves has a radially inwardly directed tab formed integrally with the sleeve, said tabs being located at



confronting axial ends of the sleeves and being spaced to embrace said cam means and each tab being of arcuate shape in a peripheral direction and defining the cam follower means.

4,480,530

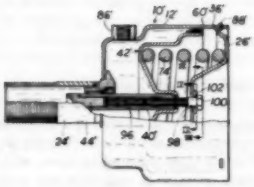
BRAKING ACTUATOR

Paul M. Holmes, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jun. 28, 1982, Ser. No. 392,543

Int. Cl.³ F01B *31/00*; F15B *21/04*; F16J *10/02*

U.S. Cl. 92—78 **10 Claims**



1. An expansible motor brake actuator for vehicles characterized by its low cost, light weight and ease of assembly including a cylinder having an axis, a rod head and an end cap, a piston rod coincident with the cylinder axis reciprocally mounted within the cylinder and extending through the rod head, a piston mounted upon the piston rod within said cylinder having a periphery sealingly engaging the cylinder, and a compression spring interposed between the end cap and piston biasing the piston toward the rod head, the improvement comprising, said piston being formed of sheet metal and having a central cylindrical recess, said piston central recess having an open outer end disposed toward the cylinder rod head and an axially spaced inner end, an inwardly extending annular shoulder flange defined upon said piston depending from said recess inner end defining an abutment for limiting insertion of the piston rod into said recess, the piston rod having a diameter slightly greater than the diameter of said cylindrical recess and being pressed into said piston recess with an interference fit, said piston including a circular periphery, a cylindrical piston portion defined adjacent said periphery coaxial with said piston recess, said piston portion having a cylindrical outer surface, sealing ring means mounted upon said cylindrical outer surface, and a continuous circumference sealed retainer ring pressed upon said outer surface restraining said sealing ring means from excessive axial movement thereon, said cylindrical outer surface having a diameter greater than the normal inner diameter of said retainer ring whereby said retainer ring is pressed upon said outer surface and radially expanded thereby, the cylinder and end cap being formed of sheet metal, the cylinder having a cylindrical wall having an open end closed by the end cap, a plurality of openings defined in the cylindrical wall adjacent said open end and circumferentially spaced about said wall an equal distance from said open end thereof, the end cap being receivable within said cylinder open end and displaceable axially inwardly of said wall openings, an end cap retainer within the cylinder open end of generally circular segment configuration having a plurality of outwardly radially extending projections defined thereon, said retainer having a normal diameter substantially corresponding to the inner diameter of the cylinder wall whereby upon the end cap being displaced within the cylinder beyond said openings said retainer is located within the cylinder wall with said projections extending into said openings preventing axial displacement of said retainer and restraining the end cap from axial movement beyond said retainer toward said cylinder wall open end.

4,480,531

MECHANICAL QUICK-RELEASE MECHANISM FOR SPRING-LOADED BRAKE CYLINDERS

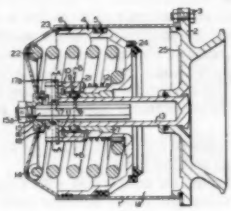
Horst Mylius, Garbsen; Josef Frania, Hanover, and Mom ilo Risti , Garbsen, all of Fed. Rep. of Germany, assignors to Wabco Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 19, 1981, Ser. No. 322,826

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046669

Int. Cl.³ F01B *9/00*

U.S. Cl. 92—29 **7 Claims**



1. A mechanical quick-release mechanism for spring-loaded brake cylinders comprising:

(a) a cylinder housing having a pressure chamber;

(b) a piston operably disposed in said housing;

(c) a piston rod connected with said piston;

(d) a compression spring acting on said piston and effective, when compressed by pressure acting in said chamber and on said piston, for effecting operation of said piston and piston rod to a brake-releasing position, said spring being effective, upon reduction of pressure from said chamber, for operating said piston and piston rod to a brake application position;

(e) a self-locking clutch connection between the piston and the piston rod including a plurality of balls lockingly disposed in an annular groove formed on a portion of the outer diameter of the piston rod;

(f) a rotatable clutch element partially surrounding said piston rod having recesses for receiving the balls when the clutch is released;

(g) a rotatable shaft having one end extending exteriorly of said housing and the other end extending into the piston rod; and

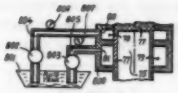
(h) a coupling element axially-movable on the rotatable shaft and being rotatable therewith for transmitting the rotary movement of the shaft to the clutch element, said coupling element extending circumferentially radially outward to engage said clutch element such that, upon rotation of said shaft, said clutch element is rotated to a position wherein said plurality of balls are moved outward into said clutch recesses.

4,480,532

FOSSIL FUEL COMBUSTION-STEAM ENGINES AND ELEMENTS FOR FLUID HANDLING DEVICES

Karl Eickmann, 2420, Hayama-machi, Kanagawa-ken, Isshiki, Japan

Filed Jan. 11, 1982, Ser. No. 338,741
Int. Cl.³ F01B *31/08*
U.S. Cl. 92—144 **1 Claim**



1. A cylinder in a fluid handling device with temporary high pressures and temperatures in said cylinder which vary in continuing cycles periodically,

wherein at least two outer chambers are mounted sealed from each other around an upper portion and a lower portion of said cylinder while said outer chambers are formed in an outer housing which surrounds that outer chambers around said cylinder;

wherein

individual ports are provided through said outer housing to said outer chambers individually;

wherein

said outer chamber around said upper portion of said cylinder is a first outer chamber and said outer chamber around the lower portion of said cylinder is a second outer chamber with a first port of said ports on said first outer chamber and a second port of said ports on said second chamber;

wherein

said first port is communicated to a supply source of a first pressure and said second port is communicated to a supply source for a second pressure to fill said first outer chamber with said first pressure and to fill said second outer chamber with said second pressure; and;

wherein

said cylinder temporary obtains said first pressure substantially as a first medial pressure radially inwards of said first outer chamber, while said cylinder temporary obtains said second pressure substantially as a second medial pressure radially inwards of said second outer chamber;

whereby

the wall of said cylinder is at least temporary subjected to substantially equal pressures in the respective areas of said wall radially inwards of said first and second outer chambers

in order

to prevent excessive radial deformation of said wall under different pressures outwards and inwards of said wall of said cylinder.

4,480,533

CONTROL FOR VENT DOOR

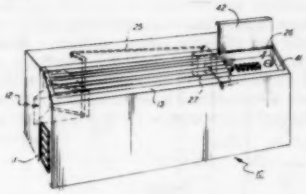
Theodore S. Bolton; James E. Napolitano, and Bruce T. Banner, all of Liverpool, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,706
Int. Cl.³ F24F *1/02*
U.S. Cl. 98—38 B **10 Claims**

1. In an air conditioner unit having a vent door that is movable from a closed position to an open position to allow outside air to be mixed with conditioned air and a control panel having an align series of function switches that are individually depressed to initiate a selected function, the improvement comprising

biasing means for resiliently urging the vent door into a closed position,

manually actuated control means mounted on the control panel that is operatively connected to the vent door for moving the vent door from a closed position to an open position;



latching means associated with the control means for locking the vent door in the said open position against the action of the biasing means, and

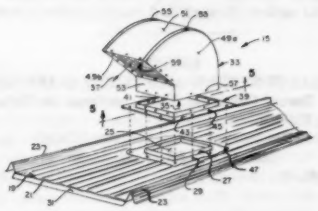
a release mechanism that is responsive to at least one of the said function switches for unlocking the latching means upon the depression of said at least one function switch whereby the vent door is allowed to move to the closed position under the influence of the biasing means.

4,480,534

GRAIN BIN ROOF VENT

Craig Sloan, Shelby County, Ill., assignor to Grain Systems, Inc., Assumption, Ill.

Filed Nov. 1, 1982, Ser. No. 437,893
Int. Cl.³ E04H *7/00*
U.S. Cl. 98—55 **2 Claims**



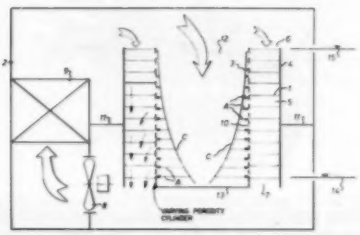
1. In a grain bin having a generally cylindrical bin body and a conical roof, said roof comprises a plurality of panels secured together in side to side relation, wherein the improvement comprises: at least one of said roof panels having an opening therein, a flange continuously sealably secured relative to said one roof panel and projecting outwardly therefrom so as to define said opening, said roof panel flange preventing water from flowing down said roof and into said opening, and a roof vent for being secured to said one roof panel in register with said opening, said roof vent comprising a body defining an air passageway therethrough, one end of said body constituting the inlet of said air passage and the other end of said body constituting the outlet of said air passage, said roof vent further comprising a base frame having flanges secured to said inlet end of said roof vent body and flashing flanges secured to said base frame flanges, said flashing flanges being secured to the outer face of said one roof panel around said opening and said base frame flange being disposed proximate to and outboard from said roof panel flange.

4,480,535

APPARATUS FOR AIR-TREATMENT OF PRODUCTS

Leif Jaxmar, Vallåkra, and Allan Alfred, Helsingborg, both of Sweden, assignors to Frigoscandia Contracting AB, Sweden

Filed Jun. 7, 1983, Ser. No. 501,910
Claims priority, application Sweden, Jun. 22, 1982, 8203873
Int. Cl.³ A23B 4/06
U.S. Cl. 99—476 2 Claims



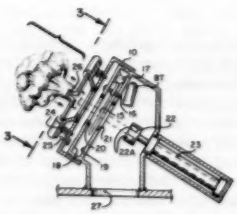
1. Apparatus for air-treatment of various products, such as foodstuffs, comprising a chamber having supported therein inner and outer spaced cylinders defining an air flow passage therebetween extending from one end of the cylinders to an opposite end of the cylinders, an endless foraminous conveyor belt for the products supported along a helical path in said passage such that air entering said passage at said one end of the cylinders and exiting said passage at said opposite end of the cylinders passes through successive turns of the conveyor belt, said inner cylinder being perforated and having an opening at one end for the entry of air to said inner cylinder, the opposite end of said inner cylinder being sufficiently closed to cause the lastmentioned air to exit from said inner cylinder through the perforations thereof, into said passage, and out of said opposite end of the outer cylinder, and means for causing air to enter said passage and said inner cylinder at said one end and to exit from said passage at said opposite end, the porosity of said inner cylinder varying along the length thereof whereby the airflow through said inner cylinder is controlled.

4,480,536

BROCCOLI BUNCHING AND CUTTING APPARATUS

Daniel E. Burns, Camarillo, Calif., assignor to Demco Inc., Oxnard, Calif.

Filed Nov. 28, 1983, Ser. No. 555,649
Int. Cl.³ B65B 13/24, 13/30
U.S. Cl. 100—6 8 Claims



1. A broccoli bunching and cutting apparatus including, in combination:

(a) a housing having a front central opening for receiving broccoli stems to be bunched and cut;

(b) pneumatically operated rubber band expanding and retracting means mounted on the exterior of said housing about said opening and including separate pneumatic cylinders with pistons terminating in fingers movable from a first position overlying the outside central area of said opening, radially outwardly to a second position beyond the periphery of said opening so that a rubber band placed on said fingers when in said first position is expanded when the fingers move to said second position;

(c) pneumatically operated broccoli stem cutting means; and

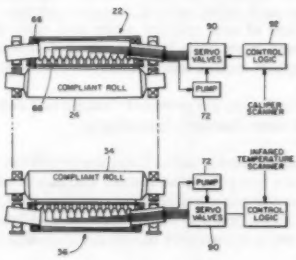
(d) pneumatic control means connected to said pneumatically operated rubber band expanding and retracting means and pneumatically operated broccoli stem cutting means responsive to a first operation to effect expansion of a rubber band so that broccoli stems can be positioned through the rubber band; and responsive to a second operation to retract the rubber band about the broccoli stems and approximately simultaneously operate said pneumatically operated cutting means to cut said stems.

4,480,537

METHOD AND APPARATUS FOR CALENDERING A WEB

Ronald D. Agronin, and Paul J. Klemmer, both of Appleton, Wis.

Filed Jul. 25, 1983, Ser. No. 516,974
Int. Cl.³ B30B 3/04, 13/00
U.S. Cl. 100—38 16 Claims



1. A method of calendering a web in a calender machine having a plurality of nips formed by roll pairs, to accurately control bulk, caliper and surface properties of the web comprising the steps of:

(a) providing an upper zone control roll and a compliant roll to form the first nip;

(b) providing a lower zone control roll and a compliant roll to form the final nip;

(c) controlling the geometric profile of the upper zone control roll as a function of the caliper of the web exiting the final nip;

(d) controlling the geometric profile of the lower zone control roll as a function of the temperature profile across the lower compliant roll,

whereby controlling the geometric profile of the upper zone control roll permits accurate control of web caliper while control of the geometric profile of the lower zone control roll maintains control of gloss, and smoothness and protects the bottom compliant roll against excessive heat.

4,480,538

MEANS FOR CORRECTING THE POSITION OF BOTTOM DEAD CENTER IN A PRESS

Akihiro Yoshida, Gifu, Japan, assignor to Kabushiki Kaisha Yamada Dobby, Bisai, Japan

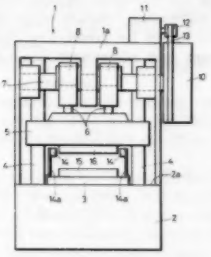
Filed Dec. 2, 1983, Ser. No. 557,067
Claims priority, application Japan, Dec. 16, 1982, 57-222440
Int. Cl.³ B30B 15/14
U.S. Cl. 100—48 5 Claims

1. For use in a press having a frame, a crankshaft rotatably mounted on said frame, and a slide connected to said crankshaft and movable in a vertical plane, wherein the correlation

between the rotational speed of said crankshaft and the bottom dead center position of said slide is determined in one-to-one correspondence, means for correcting the position of bottom dead center of said slide comprising:

a variable speed motor for rotating said crankshaft;

a sensor for sensing the position of bottom dead center of said slide; and



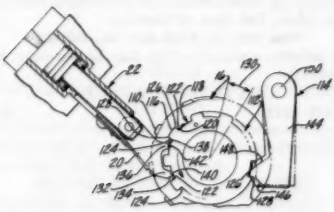
a control circuit for comparing the signal generated from said sensor which is representative of said bottom dead center position with a signal representative of a preset reference position of bottom dead center of said slide and controlling the speed of said motor to suit a speed representative of said reference position of bottom dead center of said slide.

4,480,539

ROTARY WHEEL MARKING HEAD AND INDEXING STRUCTURE THEREFOR

Frank Krembel, Jr., St. Clair Shores, Mich., assignor to Columbia Marking Tools, Inc., Detroit, Mich.

Filed Feb. 28, 1983, Ser. No. 470,634
Int. Cl.³ B41J 1/44
U.S. Cl. 101—18 **14 Claims**



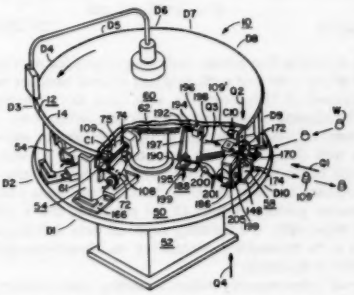
1. In a marking head having a frame, at least one marking wheel carried by said frame and rotatable relative to said frame to align successive circumferentially arrayed marking symbols thereon for marking a workpiece, and a cogwheel operably connected with said marking wheel for rotation in unison therewith and having successive circumferentially arrayed teeth with radially inward recesses therebetween with at least one tooth for each said marking symbol, the improvement comprising a reciprocal drive member carried by said frame, a drive pawl actuated by said drive member and having first and second fingers constructed, arranged and circumferentially spaced apart such that when said drive pawl is moved to an extended position by said drive member said fingers each project into one of an adjacent pair of said recesses in said cogwheel, a first face on said first finger constructed and arranged to engage a complimentary face on a tooth of said cogwheel to rotatably index said cogwheel and associated marking wheel as said drive pawl is moved to said extended position such that said marking wheel is rotated in one direction to advance a marking symbol more than one half the angular extent between an adjacent pair of said marking symbols, and a second face on said second finger constructed and arranged so that when said drive pawl is in said extended position and said cogwheel has been rotated to advance a marking symbol generally into alignment for marking a workpiece said second face can engage a complimentary face on a tooth to limit further rotation in said one direction of said marking wheel to less than about one half of the angular extent between an adjacent pair of said marking symbols, whereby movement of said pawl from its retracted to its extended position advances a marking symbol generally into alignment for marking a workpiece and while said drive pawl is in said extended position such advancing of said marking symbol beyond such alignment for marking a workpiece is limited to not more than about one half the angular extent between adjacent marking symbols.

4,480,540

PRINTING APPARATUS AND METHOD

William E. Lock, Horseheads, and Donald C. Peters, Savona, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,726
Int. Cl.³ B41F 17/18, 5/22
U.S. Cl. 101—36 **19 Claims**



1. A printing apparatus for decorating surface portions of articles which comprises:

means for creating a complete design to ultimately be transferred to the surface of an article to be decorated;

said creating means including a plurality of arcuately spaced-apart printing stations positioned radially about an axial center of rotation, with each station having means for creating a portion of said complete design;

each of said printing stations including a first conical surface having a first central axis with the apex of said first conical surface lying therealong, said first conical surface being mounted for rotation about said first central axis, and a second conical surface having a second central axis with the apex of said second conical surface lying therealong, and means for mounting said second conical surface for rotation about said second central axis in continuous contact with said first conical surface along a line of contact therebetween for forming a portion of the design on said second conical surface;

means for collecting the design portions from each of the printing stations, including a planar collector surface mounted for rotation in a plane about said axial center of rotation;

said collector surface and the second conical surface of each of said printing stations being mounted for periodic engagement with each other along a line of contact therebetween for transferring the design portion from each said second conical surface to said collector means for forming a complete design thereon;

the line of contact between said first and second conical surfaces and the line of contact between each second conical and said collector surface intersecting at a point coincident with said axial center of rotation of said collector surface and coincident with the apex of each of said first and second conical surfaces; and,

means for transferring the complete design from said collector surface to surface portions of an article to be decorated.

4,480,541

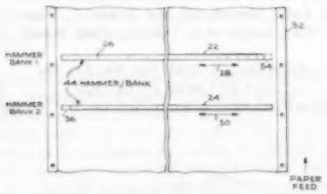
CONTROL SYSTEM FOR DOT MATRIX LINE PRINTER

Lorne H. Grummett, Costa Mesa, Calif., assignor to Trilog, Inc., Irvine, Calif.

Filed May 3, 1982, Ser. No. 374,265

Int. Cl.³ B41J 3/12

U.S. Cl. 101—93.04 **7 Claims**



1. A matrix line printer including means for moving a paper web along a defined path, first and second hammer banks each comprised of N individually actuatable dot hammers respectively aligned along first and second print rows extending substantially perpendicular to the direction of movement of said web along said path, a motor coupled to said first and second banks for moving said banks along said print rows, to sweep each hammer across C character positions wherein each character position defines D dot positions, and a control system responsive to externally supplied data defining character lines to be printed for controlling said hammers, said control system comprising:

read/write memory means including multiple line buffers;

a first processor means coupled to said memory means and including means responsive to said externally supplied data for successively storing sets of N×C character bytes in said line buffers, each set defining one character line to be printed and each being stored in a different one of said multiple line buffers;

a second processor means coupled to said memory means and including means for selecting a sequence for reading from said multiple line buffers and a sequence for reading character bytes from each selected line buffer;

first and second registers, each capable of storing N dot data bits, respectively coupled to said first and second hammer banks; and

mapper means responsive to each character byte selected to be read by said second processor means for supplying a single dot data bit to one of said registers for each of C×D positions of the hammer bank coupled thereto during its movement along its print row.

4,480,542

DEVICE FOR INK PROFILE-DEPENDENT REGULATION OF DAMPENING MEDIUM

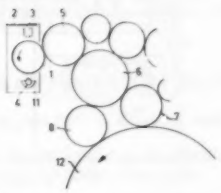
Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen, Heidelberg, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 565,144

Int. Cl.³ B41L 23/04; B41F 7/24, 33/10

U.S. Cl. 101—148 **12 Claims**

1. Device for ink profile-dependent regulation of dampening medium in an offset printing unit having an inking-dampening unit which, over the width of a type forme, supplies a dampening medium film of substantially uniform thickness to a plate cylinder and to an inking part of the inking-dampening unit comprising a hydrophilic measuring roller, measuring means adjacent said measuring roller for determining extent of wetting of an outer cylindrical surface of said measuring roller section-by-section over the width of said measuring roller and for transmitting corresponding signals, means for varying the proportion of dampening medium in the ink film section-by-section, control means for converting the signals from said measuring means into adjustment commands and applying



them to said proportion varying means for varying the proportion of dampening solution in the ink film section-by-section, said hydrophilic measuring roller being in cooperative engagement with a rubber-covered ink roller, said control means being actuatable in accordance with the signals and through the intermediary of the temperature on the cylindrical surface of said measuring roller for varying the quantity of dampening medium in at least an individual zone of the width of said measuring roller so that the dampening-medium film accepted by said measuring roller from said rubber-covered ink roller is influenced.

4,480,543

ENCLOSED GRAVURE PRINTING MACHINE

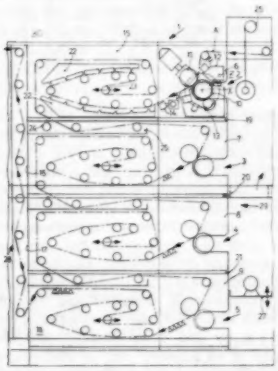
Hatto Hechler, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,403

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210767

Int. Cl.³ B41F 9/02, 9/18

U.S. Cl. 101—152 **18 Claims**



1. Multi-color gravure web printing machine for continuous prime and verso printing on a web (A) and utilizing ink which is subject to emission of vapors

comprising the combination of

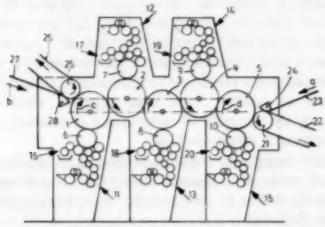
a first essentially gas-tight upright housing forming a first tower housing structure (1) having a back wall;
a first plurality of printing systems (2, 3, 4, 5) positioned above each other and forming a first tower located within the tower housing structure;
a first plurality of essentially horizontally placed fire-resistant separating walls (19, 20, 21) separating the first tower housing structure into a plurality of chambers (15–18);
ink drying means (22) located in the chambers and positioned adjacent the back wall, and laterally with respect to the printing systems,
whereby, upon drying of ink after printing in the respective systems, vapors are released;
the tower housing structure, the printing systems, the ink drying means, and the fire-resistant separating walls forming a first printing system tower assembly,
with
a second printing system tower assembly, similar to said first printing system tower assembly, and positioned back-to-back with respect to said first printing system tower assembly, in which the relative positions of the ink drying means and the printing systems are arranged in mirror-image relation with respect to the first assembly, the ink drying means being located in the chambers of the respective tower assemblies, upon placement of the tower assemblies back-to-back, such that the ink drying means will be adjacent each other and the printing systems remote from each other to be positioned at outer sides of the combination of back-to-back tower assemblies;
and means for guiding a continuous web (A) of printing substrate through the first printing system tower assembly from an upper printing system in a vertically progressing path between an upper printing system and a lower printing system of the vertically located printing systems for printing on the prime side of the web,
then guiding said continuous web towards an upper printing system of the second printing system tower assembly,
and then guiding the continuous web in a generally vertically progressing path between an upper printing system and a lower printing system of the vertically located printing systems of the second printing tower assembly for verso printing on said continuous web of printing substrate.

4,480,544

HIGH-PRODUCTION ROTARY OFFSET PRINTING MACHINE

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 10, 1983, Ser. No. 465,498
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207791
Int. Cl.³ B41F *7/02, 13/00*
U.S. Cl. 101—177 **2 Claims**



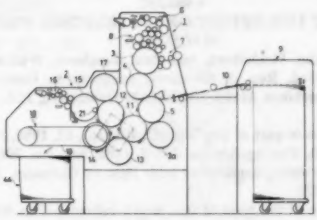
1. High-production rotary offset printing machine, for printing on two substrates, comprising
at least two printing systems, each including
a blanket cylinder (1–5);
a plate cylinder (6–10) associated with a respective blanket cylinder, and transferring a partial inked image to the associated blanket cylinder;
an inker (11, 15) associated with a respective plate cylinder (6, 10),
said blanket cylinders of the at least two printing systems being positioned in mutually contacting arrangement for transfer of the respective partial images between each other, whereby each blanket cylinder will carry a composite image formed by the respective partial images;
a first impression cylinder (21) in engagement with one (5) of the blanket cylinders; and
at least one further impression cylinder (25) positioned in engagement with another one (1) of the blanket cylinders to permit feeding one substrate between said one blanket cylinder and the first impression cylinder and feeding of another substrate between said another one (1) blanket cylinder and the further impression cylinder (25).

4,480,545

OFFSET PRESS HAVING TWO PRINTING UNITS WITH ALTERNATE PATH DELIVERY CYLINDERS

Nobuhiko Fujisawa; Shozo Tanibe, and Tatsunori Hujiki, all of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Jun. 7, 1983, Ser. No. 502,062
Claims priority, application Japan, Jun. 8, 1982, 57-98881
Int. Cl.³ B41F *5/16*
U.S. Cl. 101—183 **8 Claims**



1. An offset press, comprising; a first printing unit and a second printing unit, said first printing unit comprising a plate cylinder, a blanket cylinder and an impression cylinder, said second printing unit comprising a printing cylinder, a paper delivery cylinder and first and second transfer cylinders, said cylinders of said second printing unit having their axes located at the four corners, respectively, of a square, said printing and second transfer cylinders defining alternative transport paths for the printing paper.

4,480,546

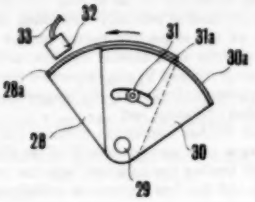
APPARATUS FOR DETECTING DEFECTS OF PRINTING SHEETS USING ADJUSTABLE LENGTH ROTATABLE SECTOR

Chiyomatsu Uno, Koshigaya, and Tamio Kuroda, Soka, both of Japan, assignors to Komori Printing Machinery Co., Inc., Azumabashi, Japan

Filed Nov. 5, 1981, Ser. No. 318,342
Claims priority, application Japan, Dec. 5, 1980, 55-172212
Int. Cl.³ B41F *13/24*; G01N *21/86*
U.S. Cl. 101—248 **3 Claims**

1. Apparatus for detecting defects in the side edge of a moving printing sheet, comprising:
a detector for detecting the presence or absence of said printing sheet, said detector being positioned along the longitudinal path of travel of said side edge;
a detection timing means for producing a detection timing signal, said detection timing means having a rotatable sector shaped member with a variable length periphery

defined by adjustably interconnected overlapped sectors, with a timing sensor disposed to face said periphery, said sensor being operable to produce said detection timing signal while said periphery passes thereby, and with the time required for said periphery to pass by said sensor



corresponding to the time required for said side edge to pass by said detector; and

means for producing an output signal when said detector detects absence of said printing sheet while said detection timing signal is being produced.

4,480,547

INK DUCT FOR OFFSET OR LETTERPRESS PRINTING MACHINES

Willi Jeschke, Heidelberg, and Rudi Junghans, Wilhelmsfeld, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

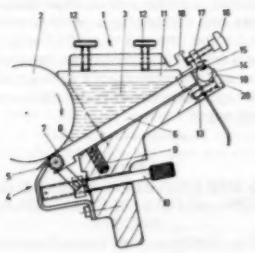
Continuation-in-part of Ser. No. 167,401, Jul. 11, 1980, Pat. No. 4,344,360. This application Jul. 7, 1982, Ser. No. 396,143

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928125

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ B41F *31/02*

U.S. Cl. 101—363 **2 Claims**



1. Ink duct assembly for offset or letterpress printing machines having an ink duct and a rotary duct roller of given circumference defining an ink gap therebetween and an ink metering unit for adjusting the ink gap, respectively, zonewise in axial direction of the duct roller, comprising an elastic foil, the ink metering unit being covered by said elastic foil and being engageable through the intermediary of said elastic foil with the duct roller, and foil retaining and displacing means disposed in an upper region of the ink duct both for retaining said foil against frictional force of the rotary duct roller and for displacing said elastic foil alternately in opposite directions generally tangential to the circumference of the duct roller.

4,480,548

DEVICE FOR VARNISHING SYSTEMS TO PREVENT VARNISH DRYING IN OUT OF PAPER SIZE SIDE ZONES OF ROLLERS

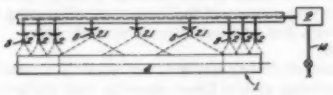
Herbert Rebel, Rodgau, and Manfred Herold, Kahl, both of Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,735

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1982, 3220537

Int. Cl.³ B41L *41/00*

U.S. Cl. 101—426 **11 Claims**



1. During the operation of a printing press having a varnishing system with a plurality of rollers for conveying varnish to paper being printed, a method of preventing the drying and accumulation of varnish in the side zones of the rollers which are out of the paper size comprising the step of continuously and selectively applying during printing dampening agent capable of dissolving the varnish to the side zones of the rollers which are out of the paper size.

4,480,549

LITHOGRAPHIC PRINTING PLATE

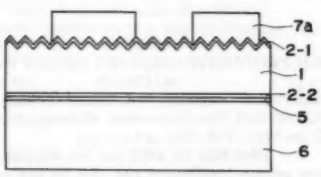
Kiyomi Sakurai, and Seiji Arimatsu, both of Neyagawa, Japan, assignors to Nippon Paint Co., Ltd., Japan

Continuation of Ser. No. 244,648, Mar. 17, 1981, abandoned. This application Dec. 30, 1982, Ser. No. 454,554

Claims priority, application Japan, Mar. 17, 1980, 55-34641; Mar. 17, 1980, 55-34642

Int. Cl.³ B41N *1/08*

U.S. Cl. 101—456 **6 Claims**



1. A lithographic printing plate which comprises:

(a) a support comprising an iron foil prepared by electroforming, wherein one surface of said foil is in contact with an electrolyte and the opposite surface is in contact with a negative electrode, said surface in contact with said electrolyte having a relatively rough surface compared to said surface in contact with said negative electrode and wherein the porosity of said surface in contact with said electrolyte is about 4~8.5μ,

said foil being electroplated with a hydrophilic metal on both surfaces to form a hydrophilic metal layer sufficiently thin as to substantially retain the porosity of the iron foil, and

(b) an oleophilic image area formed from a photosensitive resin on said surface of the hydrophilic metal coated iron foil, which was in contact with said electrolyte and a non-image area where said resin is not present on said surface of said hydrophilic metal coated iron foil which was in contact with said electrolyte,

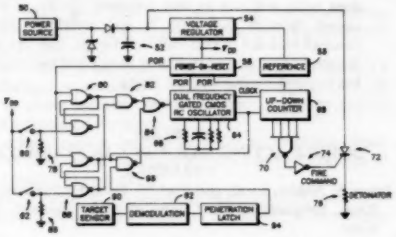
said non-image area exhibiting good hydrophilic and water retentive properties in lithographic printing.

4,480,550

RELATIVE VELOCITY SENSOR FOR VOID SENSING FUZES AND THE LIKE

Edgar J. Abt, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 26, 1982, Ser. No. 402,010
Int. Cl.³ F42C *11/06*
U.S. Cl. 102—215 **9 Claims**



1. A relative velocity sensor for a projectile fuze comprising:

a first electrical switch at a first location on a projectile, said first switch being responsive to contact of said first location with a target skin by producing a first electrical signal;

a second electrical switch at a second location on said projectile, said second switch being responsive to contact of said second location with a target skin by producing a second electrical signal; and

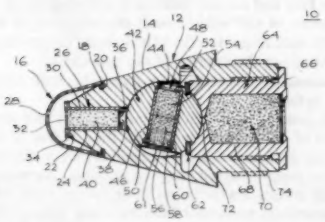
timing means responsive to said first and second electrical signals for producing an adaptive delay time and for detonating said projectile when said adaptive delay time is up.

4,480,551

POINT-DETONATING VARIABLE TIME-DELAYED FUZE

Louis LoFiego, Chatsworth, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Jun. 8, 1983, Ser. No. 502,403
Int. Cl.³ F42C *1/10, 15/22*
U.S. Cl. 102—245 **9 Claims**



1. An improved point-detonating, variable time-delayed fuze for projectiles, which fuze comprises, in combination:

a. a fuze body;

b. a readily crushable nose disposed at the front end of said body;

c. a thermal initiator disposed in said nose, said initiator including

i. a cup having a closed front end and an open rear end closed by a non-metallic, thermally destructive closure; and,

ii. a readily thermally ignitable, incendiary, exothermic chemical material disposed in said cup;

d. a rotor ball disposed in said body rearwardly of and and adjacent to said initiator;

e. a thermally ignitable flash detonator disposed in said rotor ball, said detonator including

i. a cup having a closed thermal barrier end and an opposite end closed by a disk,

ii. an insulating barrier material in said cup adjacent to said closed thermal barrier end, and

iii. a primary explosive material in said cup adjacent to said insulating thermal barrier;

f. a main charge of booster explosive disposed in the rear end of said fuze body adjacent said rotor ball; and,

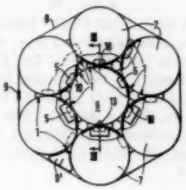
g. biasing means connected to said rotor ball for maintaining said detonator out of alignment with said initiator and main booster explosive charge except during rapid rotation of said fuze upon firing of a projectile to which said fuze is attachable.

4,480,552

CLUSTERED AMMUNITION EJECTABLE FROM CANISTERS

Alfred Eckel, Treuchtlingen; Manfred Kastenhuber, Rednitzhembach, and Erich Bock, Nuremberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremburg, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,398
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139473
Int. Cl.³ F42B *25/16, 13/50*
U.S. Cl. 102—393 **2 Claims**



1. In clustered ammunition ejectable from canisters for combating of ground targets, including a central body encompassed by the ammunition; and a member clustering the ammunition; the improvement comprising a clamping band retaining the ammunition; and form-fitted components for fixing said ammunition in position within said band, each of said form-fitted components being x-shaped and having concave side walls in conformance with the radii of the ammunition and said central body, each of said components including projections engageable in corresponding recesses in said ammunition.

4,480,553

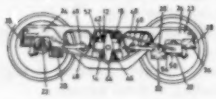
STABILIZED RAILWAY VEHICLE

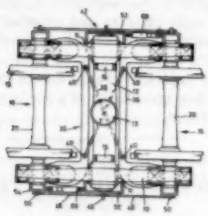
Herbert Scheffel, Pretoria, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Filed Aug. 31, 1982, Ser. No. 413,409
Claims priority, application South Africa, Aug. 31, 1981, 81/6026
Int. Cl.³ B61F *5/38*
U.S. Cl. 105—167 **5 Claims**

1. A railway truck having a longitudinal axis in its direction of travel and comprising a load-bearing means; two wheelsets each including an axle fixed to two wheels that have tapered treads for generating steering forces on track curves; a pair of axle boxes on each wheelset; resilient suspension elements suspending the load bearing means to the axle boxes and permitting each wheelset to approach a radial position in a curve;

and interconnecting means extending substantially diagonally of the truck and interconnecting the wheelsets to couple their yawing and lateral movements in opposite senses to counteract the tendency of the wheelsets to hunt without interfering with their natural curving characteristics, with the improvement of additional connecting means which includes on each side and





spaced from the longitudinal axis of the truck a pair of linkages and a lever arm pivoted at a position between its ends on the loadbearing means about an axis midway between and parallel to the axles with linkages on the same side of the truck connected to opposed ends of the lever arm and each to a separate axle box and with the lever arm being independent of any other connection.

4,480,554

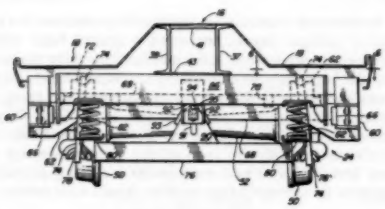
ARTICULATED RAIL CAR FOR VEHICULAR TRAILERS

Rene H. Brodeur, 2108 Beechwood Ave., Wilmette, Ill. 60091; Boris S. Terlecky, 234 Lippincott La., Fox Lake, Ill. 60020; Ronald P. Sellberg, 5 S. 649 Wright, Naperville, Ill. 60540, and William R. Halliar, 942 Pearl St., Whiting, Ind. 46394

Division of Ser. No. 59,773, Jul. 23, 1979, Pat. No. 4,339,996. This application Jul. 1, 1982, Ser. No. 394,174

Int. Cl.³ B61F *3/00, 5/22, 5/32*

U.S. Cl. 105—171 **1 Claim**



1. A single axle railroad wheel truck for rail cars comprising:
two railroad wheels joined by an axle to form a wheel unit including axle extensions extending outwardly from said wheels;
bearing means rotatably supporting said axle extensions;
side frame means supporting said bearing means; means rigidly connecting said side frames;
a flange mounted at each end of said side frame means and extending therefrom;
hanger means engaging each of said flanges;
cross members positioned beneath said flanges, and each end of said cross members engaging a hanger means;
cross beams mounted to a lower surface of the rail car adjacent an end thereof;
spring means positioned between said cross beams and said cross members for flexing under the load and forces incident to travel over rail tracks, means for permitting said cross members to move vertically while preventing said cross members from moving longitudinally and preventing said cross members from rotating, wherein said means for permitting comprises a stabilizer flange mounted to and extending vertically from said cross members, a pair of stabilizer plates mounted on said cross beams and defining a vertically arranged passageway between said plates through which said stabilizer flange slides, said plates preventing longitudinal and rotational movement of said cross members while permitting vertical movement, and further comprising a vertically arranged slot in said stabilizer flange, tapered slots in said stabilizer plates coincident with said slot in said stabilizer flange, a key positioned through said slots in said stabilizer plates and through said slot in said stabilizer flange, said key preventing movement of said stabilizer flange and said cross member beyond predetermined limits.

4,480,555

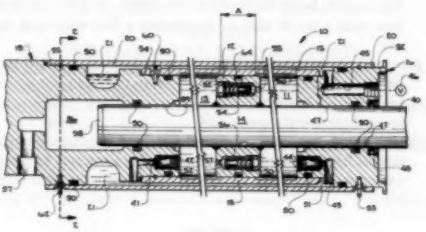
DOUBLE ACTING RAILWAY CAR STABILIZING CYLINDER

James E. Shafer, Leoti, and Earl M. Ford, Hutchinson, both of Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed Jan. 22, 1979, Ser. No. 5,545

Int. Cl.³ B61F *3/08, 5/24, 5/50*

U.S. Cl. 105—199 R **6 Claims**



1. An oscillation restraint device for a railway vehicle including a vehicle body and a wheel truck rotatable with respect to the body, said device comprising:
a hydraulic cylinder mounted on a first member of the vehicle;
a piston disposed within the cylinder to divide the cylinder into first and second chambers and coupled to a second member of the vehicle such that rotation of the wheel truck with respect to the vehicle body causes the piston to move along the interior of the cylinder;
a substantially incompressible hydraulic fluid contained in the cylinder;
bypass passage means interconnecting first and second portions of the cylinder such that fluid is free to travel between the first and second chambers when the piston is in a first predetermined range of positions, corresponding to truck orientation for travel along curved track, and fluid is substantially prevented from traveling through the bypass passage between the first and second chambers when the piston is in a second predetermined range of positions, corresponding to truck orientation for travel along substantially straight track;
a first pressure relief valve disposed within the piston to pass fluid from the first chamber to the second chamber when the pressure in the first chamber exceeds a predetermined value;
a second pressure relief valve disposed within the piston to pass fluid from the second chamber into the first chamber when the pressure in the second chamber exceeds a predetermined value;

said piston, cylinder, fluid, bypass passage means and first and second valves automatically cooperating to substantially block the flow of fluid between the first and second chambers when the piston is in the second predetermined range of positions, and thereby to hydraulically lock the wheel truck so as to substantially prevent all wheel truck oscillations when the first and second valves are closed.

2. A double acting stabilizer cylinder utilized between the truck and frame of a railroad car for preventing hunting due to oscillation motion comprising:

a double ended cylinder rod carrying a piston;

a cylinder barrel containing the rod and piston defining two cylinder chambers;

a pair of heads each closing an end of the barrel including openings therein for receipt and passage of opposing ends of the cylinder rod;

a sleeve concentrically positioned over the barrel defining a precharged accumulator chamber for receipt of both oil and air under pressure, said heads also closing the ends of the accumulator chamber;

check valve means in the bottom of the accumulator chamber between the accumulator chamber and at least one of the cylinder chambers;

relief valve means in the piston allowing high pressure oil in each cylinder chamber to pass to the other cylinder chamber;

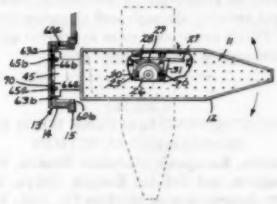
at least one pair of longitudinal groove means on the inside surface of the cylinder barrel extending from both ends of the barrel inward toward the center with each groove terminating at a point approximate the center of the cylinder providing a longitudinal distance between the ends of the grooves which is less than fifteen percent of the overall cylinder stroke, whereby in the center position the cylinder rod and piston are hydraulically locked against movement until sufficient pressure is built up to open the relief valve means.

4,480,556

ADJUSTABLE FOLDING IRONING BOARD

Kermit H. Wilson, Edina, and Ronald R. Carlson, Excelsior, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

Filed Jan. 15, 1982, Ser. No. 339,406
Int. Cl.³ D06F *81/00*
U.S. Cl. 108—48 **6 Claims**



1. An adjustable folding ironing board for attachment to a wall or other support, comprising:

a mounting frame;

an ironing board surface member;

turntable means for rotatably securing said ironing board surface member to said mounting frame;

support leg means pivotally connected at one end thereof to said mounting frame, including means for pivotal connection of the other end thereof to said wall or other support;

height control means for securing to said wall or other support at a position above the connection of said support leg means;

fold-up control arm means pivotally connected at one end thereof to said mounting frame and including means pivotally connecting the other end thereof to said height control means, said support leg means and fold-up control arm means configured to permit folding of said ironing board between a generally horizontal use position and a generally vertical storage position with the underside of the ironing board surface member adjacent the wall or other support; and

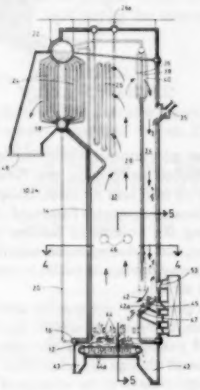
said height control means including adjustable means for moving said fold-up control arm means between an upper position and a lower position with said support leg means pivoting accordingly to move said ironing board surface member to a further generally horizontal use position lower than the first use position.

4,480,557

STEAM GENERATOR WITH INTEGRAL DOWN-DRAFT DRYER

Frank W. Hochmuth, P.O. Box 186, Brewer, Me. 04412

Continuation-in-part of Ser. No. 333,834, Dec. 23, 1981, abandoned. This application Aug. 15, 1983, Ser. No. 523,375
Int. Cl.³ F23B *7/00*
U.S. Cl. 110—234 **6 Claims**



1. In a steam generating furnace having a combustion chamber for burning high moisture content fuel comprising a vertical passageway arranged above a fuel burning grate for upward flow therein of the products of combustion, the improvement permitting at least partial pre-drying of high moisture content fuel fed to said grate comprising

means forming a second passageway comprising a drying shaft arranged generally parallel to said first-named passageway;

means establishing communication between the upper end portions of said passageways so as to divert some of the upwardly flowing hot gaseous products of combustion from the upper portion of said combustion chamber into the upper portion of said drying shaft;

means providing an opening between the lower end portions of said passageways above the level of said grate, said drying shaft being sufficiently offset from said first-named passageway to prevent upward flow therein of products of combustion from said combustion chamber;

means for introducing the high moisture content fuel into said drying shaft near its upper end so that it will fall downwardly therein by gravity whereby moisture is evaporated from the fuel thereby cooling and increasing the density of the diverted gases to induce downward flow by gravity thereof along with the falling fuel; and

a ledge mounted in the lower end portion of said drying shaft facing said opening at a level above that of said grate, said ledge providing a downwardly inclined surface ex-

posed to the falling fuel for deflecting it through said opening into said combustion chamber for burning on and above said grate, the cooled gases being recirculated to said combustion chamber through said opening;

said means establishing communication between the upper end portions of said passageways being located at a level above the burning fuel to further induce flow of the diverted gases.

4,480,558

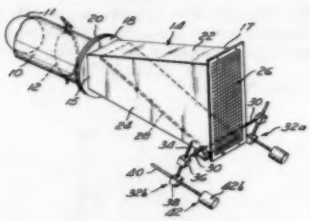
ADJUSTABLE AIR INLET CONTROL SYSTEM

Robert J. Russell, 1332 Lymric Way, Bakersfield, Calif. 93309

Filed Oct. 8, 1982, Ser. No. 433,512

Int. Cl.³ F23L *1/02*

U.S. Cl. 110—297 **12 Claims**



1. A primary air inlet control system for controlling the inlet air volume in a forced air furnace, said furnace having means for forcing draft air into said air inlet, comprising:

funnel means located upstream from said draft forcing means for increasing the volume of laminar flow air admitted into said inlet, and reducing noise, said funnel means defining a passageway having its outlet in communication with said furnace air inlet;

control means pivotably mounted in said passageway, said control means being responsive to the forces exerted by gases in said passageway and providing leverage means whereby a small change in said control means produces a relatively large change in the volume of incoming gases to provide optimum combustion in said furnace;

means for adjustably pre-disposing said control means to obstruct said passageway to provide means for the prevention of thermal siphoning when the furnace blower is not in operation.

4,480,559

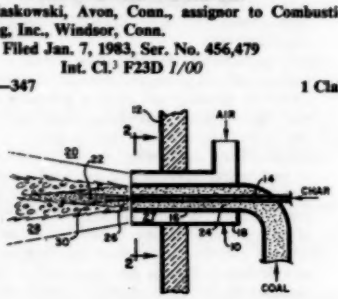
COAL AND CHAR BURNER

Henry J. Blaskowski, Avon, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 7, 1983, Ser. No. 456,479

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **1 Claim**



1. A method for firing coal and char with air under substoichiometric conditions in a slagging coal gasifier vessel, comprising the steps of:

feeding said char into said vessel as a central stream of char and air, the mass flow rate of the air in the central stream being approximately 0.1 times the mass flow rate of the char in the central stream;

feeding said coal into said vessel as a first annular stream of coal and air immediately surrounding the central stream, the mass flow rate of the air in the first annular stream being approximately 1.5 times the mass flow rate of the coal in the first annular stream; and

feeding any remaining air necessary for the gasification process into the vessel as a second annular stream surrounding both the central stream and the first annular stream for forming an annular exothermic reaction envelope of coal and air surrounding the char stream.

4,480,560

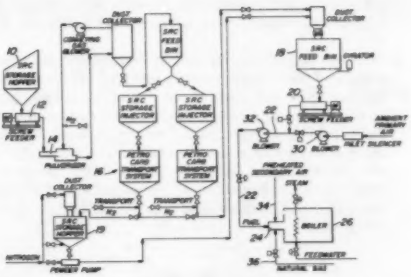
PNEUMATIC CONVEYING OF PULVERIZED SOLVENT REFINED COAL

Dennis R. Lennon, Allentown, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed Dec. 9, 1983, Ser. No. 560,015

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—342 **1 Claim**



1. In a system for the pneumatic conveying of pulverized solvent refined coal to a burner wherein the solvent refined coal is pulverized to a particle size in the range of 50% through a 200 mesh screen to 98% through a 325 mesh screen and conveyed in an air stream through a transport line under conditions of dilute phase pneumatic flow of the fluid through said transport line, the improvement comprising maintaining the transport fluid velocity through said transport line above approximately 95 feet per second so as to prevent saltation of the solvent refined coal in said transport line.

4,480,561

ELECTRONIC SEWING MACHINE WITH TROUBLE DIAGNOSING FUNCTION

Hachiro Makabe, Kanagawa; Haruhiko Tanaka, Tokyo; Akira Orii, Kanagawa, and Takeshi Kongoh, Tokyo, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1983, Ser. No. 485,252

Claims priority, application Japan, Apr. 21, 1982, 57-65377

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—158 E **1 Claim**

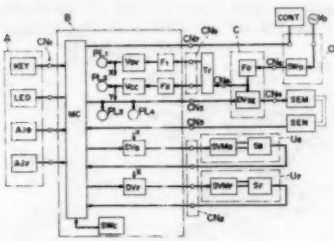
1. An electronic sewing machine having stitch forming devices including electric components and mechanical components which may be controlled in connection with the electric components, and which may be operated by electromagnetic drive motors controlled by electric stitch control signals to thereby produce stitch patterns, the sewing machine comprising;

(a) a microcomputer provided with an operation program for stitch control by the electric components and the mechanical components, and an operation program for diagnosing the malfunctions of the electric components and the mechanical components, said diagnosing program including the processes for checking predetermined items

of the electric components and the mechanical components in a predetermined order, and the designation thereof and for indicating the checking results:

(b) a changeover switch selectively operated to cause the microcomputer to selectively operate in accordance with either the stitch control operation program or the malfunction diagnosing control operation program;

(c) indication means including a plurality of illumination lamps turned on and off selectively to indicate the designated one of the patterns of the stitch control operation program and the malfunction diagnosing control operation program in dependence upon the selective operation



of said changeover switch, said lamps also indicating the checking items when the diagnosing control operation program is designated;

(d) a plurality of operation switches selectively operated to cause the microcomputer to select a pattern to be stitched and to set the sewing machine in relation to the selected pattern when the changeover switch is operated to designate the stitch control operation program, said operation switches being selectively operated to designate the checking items and the order thereof when the changeover switch is operated to designate the diagnosing control operation program.

4,480,562

SEWING MACHINE LOOP SPREADING MECHANISM

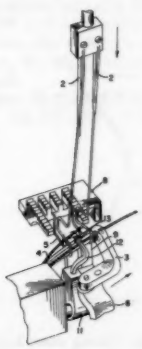
Wolf R. von Hagen, and Erwin Jürgens, both of Hemmingen, Fed. Rep. of Germany, assignors to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Filed Jan. 7, 1983, Ser. No. 456,474

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201254

Int. Cl.³ D05B *57/02, 61/00*

U.S. Cl. 112—200 **5 Claims**



1. A sewing machine having a feeding mechanism, a thread carrying looper means including an apertured looper body movable through a four motion cycle of actuation including an endwise loop seizing movement, a sidewise advance movement, an endwise return loop shedding movement and a sidewise return movement, at least one threaded reciprocatory needle means adapted for actuation in timed relation with respect to said looper means through a stitching cycle during which said needle means enter between two limbs of the looper thread in the formation of a chainstitch, a looper thread handling means adapted to spread the limbs of looper thread to form a loop for subsequent penetration by said reciprocal needle means, said thread handling means comprising:

thread spreader means being adapted to advance across the endwise path of the looper means between the aperture provided in the looper body and the reciprocal path of the needle means arranged closest to the aperture in the looper as the looper moves through the simultaneous endwise return loop shedding and sidewise return looper movements from the extended limit of its loop seizing movement, said thread spreader means thereby engaging only the looper thread and spreading only one limb of the looper thread in the direction of feed during its advance movement to permit the needle means to pass between the looper thread and the body of the looper.

4,480,563

TUFTING NEEDLE

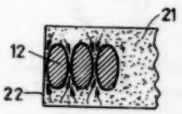
Walter Beyer, Eschweiler, and Joachim Beyer, Aachen, both of Fed. Rep. of Germany, assignors to Jos. Zimmermann, Aachen, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,367

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 8121878[U]

Int. Cl.³ D05C *15/00*

U.S. Cl. 112—222 **6 Claims**



1. A tufting needle for needle modules of tufting machines having a free shank portion with a flat cross section provided with a thread groove and eye and an anchoring shank portion, the improvement comprising:

said anchoring shank portion being of an elliptical cross section having major and minor axes wherein the major axis is of greater length than the minor axis,

the major axis of the cross sections of said free and anchored shank portions being substantially co-planar.

4,480,564

BUTTON LOCATING CLAMP FOR SEWING MACHINES

Gary W. Ponte, Passaic, N.J., assignor to The Singer Company, Stamford, Conn.

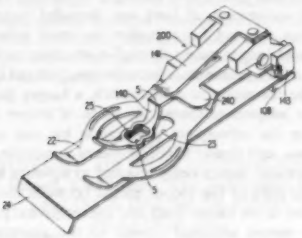
Filed Apr. 27, 1983, Ser. No. 488,898

Int. Cl.³ D05B *3/16, 29/00, 97/10*

U.S. Cl. 112—237 **1 Claim**

1. A work holding clamp for a four hole button sewing machine comprising superposed fabric gripping jaws and a button holding foot opposed to said superposed fabric gripping jaws for accommodating therebetween a four hole button in a variety of hole orientations, each of said fabric gripping jaws and said button holding foot being formed with a needle accomodating aperture, the needle accommodating aperture in said button holding foot being formed with an hourglass shape including four distinct recesses arranged generally in the corners of a square pattern conforming with the standard hole

arrangement in four hole buttons whereby the needle accommodating aperture in said button holding foot presents a



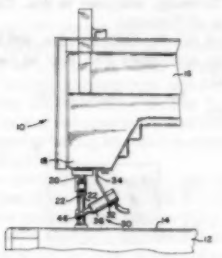
graphic indication to a machine operator of the proper hole orientation.

4,480,565

SEWING MACHINE NEEDLE COOLER

John W. Harbst, Hoffman Estates, and James A. Frendreis, Morton Grove, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Nov. 6, 1981, Ser. No. 318,703
Int. Cl.³ D05B *71/04*
U.S. Cl. 112—281 **21 Claims**



1. A device for cooling the reciprocal needle of a sewing machine comprising:

a fluid pressure operated device including operative means for directing a cooling medium from said device toward the needle, said device being arranged on said machine with said operative means being independently mounted proximate said needle and maneuverable along a generally horizontal path between a generally static operative position whereat the cooling medium is continually directed toward the sewing machine needle in a direction generally transverse to the path of said operative means, and an inoperative needle cooling position.

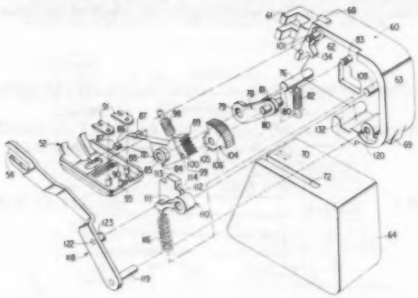
4,480,566

MENDING ATTACHMENT FOR A SEWING MACHINE

Joseph J. Lukawich, Somerville, and Kenneth D. Adams, Madison, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Aug. 25, 1983, Ser. No. 525,929
Int. Cl.³ D05B *27/20, 3/02*
U.S. Cl. 112—321 **4 Claims**

1. A presser device adapted for use with a sewing machine having a frame, a presser bar slidably supported by said frame, an endwise reciprocable needle bar carrying a sewing needle in the end thereof supported by said frame, and means in said frame for selectively laterally shifting said needle bar in the formation of zig zag stitching patterns, said device being adapted to be supported by said presser bar and being usable to implement lateral feeding of work material by said sewing needle when extended through said work material, said device comprising a presser foot, means for supporting said presser foot in a first position to implement needle penetration and withdrawal from a work material and in a second position to implement lateral feeding by said sewing needle; said supporting means including means for accommodating to various thicknesses of work material beneath said presser foot so as to enable lateral shift of various thicknesses of said work material by bringing said presser foot to said second position a fixed



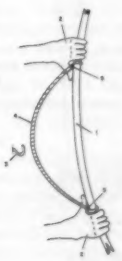
distance from said first position; said supporting means further including a presser foot carrier lever supporting said presser foot on one end thereof and means for pivotably supporting said presser foot carrier lever when bringing said presser foot to said second position when said sewing needle is in engagement with said work material; said accommodating means further comprising a gear segment on the end of said presser foot carrier lever opposite said presser foot, a pinion and a pinion carrier lever supported on said pivotably supporting means and carrying said pinion on a first axis in mesh with said gear segment.

4,480,567

PIVOTABLE RIGID LINE FOR LINKING SAILOR TO BOOM OF SURFBOARD SAILBOAT

Bengt R. Silfversparre, Pontonjargatan 20, S-112 37 Stockholm, Sweden

PCT No. PCT/SE80/00293, § 371 Date Jul. 1, 1981, § 102(e) Date Jul. 1, 1981, PCT Pub. No. WO81/01541, PCT Pub. Date Jun. 11, 1981
PCT Filed Nov. 18, 1980, Ser. No. 280,011
Claims priority, application Sweden, Dec. 4, 1979, 7909971
Int. Cl.³ B63B *35/00*
U.S. Cl. 114—39 **6 Claims**



1. An arrangement for linking chest hook means (3) secured to the body of a sailor to a boom of a surfboard type sailboat, comprising: a substantially rigid and self-supporting, single elongate line member (4), and means (5) individually securing

opposite ends of said line member to said boom (1) at two spaced attachment points for pivotal movement about said boom, whereby a sailor may grasp the boom with his forefingers adjacent the attachment points and pivotally raise the line member from a generally vertical dangling position with his thumbs, without releasing the boom, to thereby engage the line member with the hook means.

4,480,568

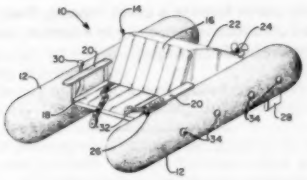
PROPELLED PONTOON CHAIR

George M. Trefethern, P.O. Box 2787, Bonita Springs, Fla. 33923, and Marian J. Bissell, 711 Banyan Blvd., Naples, Fla. 33940

Continuation of Ser. No. 240,777, Mar. 5, 1981, abandoned. This application Mar. 4, 1983, Ser. No. 472,142

Int. Cl.³ B63B *1/12*

U.S. Cl. 114—61 **11 Claims**



1. A recreational and therapeutic device, comprising:

a pair of pontoons interconnected in fixed spaced relationship to each other;

a chair having a seat and an adjustable back, said seat being maintained between said pontoons and in horizontal alignment therewith;

propulsion means positioned rearwardly of said chair and between said pontoons for propelling the device across and atop a body of water;

first control means adjacent said chair and interconnected with said propulsion means for controlling the speed of the device; and

second control means adjacent said chair for controlling the course of the device, said second control means comprising a pair of rudders connected through a linkage to a control stick, said control stick being pivotally maintained and frictionally lockable upon a rod, said friction locking securing positioning of said rudders during movement of the device in water.

4,480,569

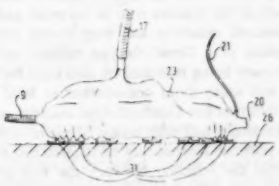
CONTAINER FOR GROUND MATERIAL REMOVED BY A GROUND WORKING DEVICE FROM THE BOTTOM OF A WATERCOURSE

Abraham van der Veen, No. 4, Bergpad, 7731 BE Ommen, and Jelle van der Veen, No. 33, De Himmen, 8618 NP Oosthem, both of Netherlands

Filed Jan. 12, 1983, Ser. No. 457,470

Int. Cl.³ B63C *11/00*

U.S. Cl. 114—74 T **2 Claims**



1. An underwater device for collecting material removed from the bottom of a watercourse, said device comprising a flexible bag, a flexible conduit connected to said bag and communicating with the interior thereof, means for discharging a mixture of said material and water through said flexible conduit into said bag whereby said bag becomes increasingly inflated by such mixture, said bag including outlet means for draining water therefrom whereby said bag is progressively inflated by said material, and means for supporting said bag out of contact with said bottom, the means last mentioned comprises a buoyancy compartment in said bag and means for supplying air to inflate said buoyancy compartment so as to compensate for the weight of material collected and buoy said bag above said bottom, means for maintaining said bag in horizontally elongate condition, the means for maintaining comprising a horizontally disposed tensile spring within said bag, the tensile spring covering substantially the whole length of the bag and being connected with the bag at least by its front and rear ends, the tensile spring being a helical spring connected with the bag substantially throughout its length.

4,480,570

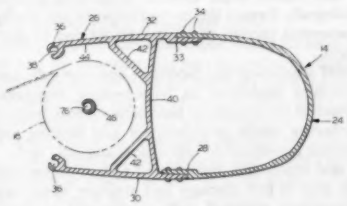
MAINSAIL FURLING MAST ASSEMBLY AND MAST CONSTRUCTION THEREFOR

Norman A. Rosenfield, Putnam; Paul M. Rosenfield, Woodstock, and Robert H. Jones, Putnam, all of Conn., assignors to Metalmast Marine, Inc., Putnam, Conn.

Filed Oct. 5, 1982, Ser. No. 432,821

Int. Cl.³ B63H *9/08, 9/10*

U.S. Cl. 114—106 **23 Claims**



1. In a mainsail furling mast assembly, the combination comprising:

A. a mast having a cross section defined by a curvilinear outer wall of generally C-shaped configuration and a transverse wall intermediate the length of said cross section, such transverse wall and outer wall defining a sail receiving compartment with an opening at the rear of said mast extending over substantially its entire length, said opening having a width equal to at least 50 percent of the maximum width of said cross section of said mast;

B. a sail furling element in said cavity supported at its upper and lower ends in said sail receiving compartment for rotation therewithin, said furling element being substantially smaller in cross section than the width of said compartment opening to permit removal of the associated sail furling element within the sail furled thereabout by movement generally radially outwardly of said compartment through said opening over substantially the entire length of said furling element; and

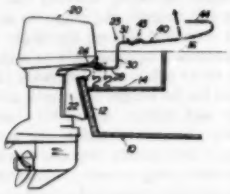
C. means on said sail furling element within said compartment for rotation of said furling element in either direction of rotation.

4,480,571

OUTBOARD MOTOR AUXILIARY STEERING SYSTEM

Ralph F. Meyer, 8629 NW. 14 Ct., Miami, Fla. 33147

Filed Dec. 29, 1982, Ser. No. 454,435
Int. Cl.³ B63H *25/02*
U.S. Cl. 114—146 **11 Claims**



1. A supplementary steering assembly for use in combination with a marine outboard motor, said steering assembly comprising:

(a) a steering arm connectable to the motor and positioned outwardly therefrom towards the interior of the boat on which the motor is mounted,

(b) connecting means mounted on the motor and disposed in interconnecting relation between the motor and said steering arm,

(c) said connecting means comprising a connecting link having opposite ends defined respectively by a first finger element and a second finger element each interconnected and extending outwardly in opposite directions from and in substantially transverse relation to a main body portion,

(d) said first finger element attachable to the motor and said body portion having a sufficient length dimensioned to extend substantially above an upper portion of a splash well of the boat when said first finger element is so attached,

(e) said second finger element comprising aperture means integrally formed therein and disposed and configured for mounting thereto of an attachment end of said steering arm,

(f) said attachment end having its oppositely disposed lateral portions positioned in force-bearing engagement with inner lateral peripheral boundaries of said aperture means, whereby lateral movement of said steering arm causes lateral movement of said connecting link, and

(g) said attachment end defining a hinge means positionable at least in part through said aperture means and having oppositely disposed surfaces disposed in force-bearing relation to upper and under surfaces of said second finger element, whereby said steering arm is pivotal on said connecting link in a vertical direction away from the boat.

4,480,572

TILLER TENDER

John Lauterbach, 1303 Shadberry La., New Port Richey, Fla.

Filed Sep. 17, 1982, Ser. No. 419,527
Int. Cl.³ B63H *25/52*
U.S. Cl. 114—162 **4 Claims**

1. An apparatus used on boats equipped with a tiller, comprising,

an elongate, flexible cord means of elastomeric construction and hence extensible along its length,

clamping means fixedly secured to a transom of a boat equipped with a tiller, said clamping means spaed equidistantly relative to a rudder operated by said tiller,

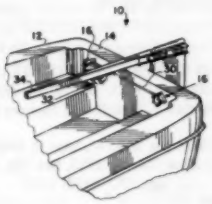
said clamping means adapted to substantially non-releasably secure opposite ends of said cord means to said transom,

a combination wedge and roller member fixedly secured to said tiller,

said combination member including a roller member for transiently engaging said cord means along its extent,

said combination member further including a forwardly opening wedge-shaped cavity means,

said cord means alternately positionable in either said roller member or said cavity means by grasping the cord means,



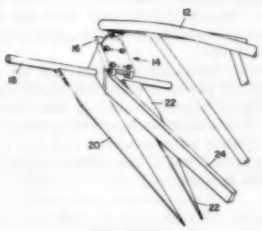
said cavity means forming a cavity tapering from its wide, forward cord-receiving opening to a narrow, cord-pinching rearward end.

4,480,573

RAIL MOUNT ANCHOR BRACKET

Robert G. Barbour, P.O. Box 25876, West Los Angeles, Calif. 90025

Filed Feb. 14, 1983, Ser. No. 466,115
Int. Cl.³ B63B *21/22*
U.S. Cl. 114—210 **17 Claims**



1. A bracket assembly for the adjustable mounting of different size Danforth-type anchors at desired positions relative to a supporting rail, comprising:

an angle bracket including first and second arms;

gripper clip loop means for holding either side of said first arm of said bracket to a supporting rail;

the second arm of said bracket being provided with slots extending substantially parallel to the intended axis of the rail to which the bracket is to be secured; and

first and second retaining and stop means for holding a crown plate of a Danforth-type anchor, said first and second means being mounted on said slots for adjustment toward and away from one-another to hold the crown plate of different size Danforth-type anchors, said first and second retaining and stop means being reversible so that the stop portions thereof may be located either toward or away from the junction between the two arms of said bracket;

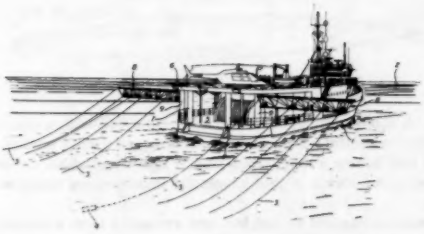
whereby said bracket may be positioned to hold different size Danforth-type anchors in at least eight different positions relative to the rail.

4,480,574

BOAT WITH SEISMIC GUN JIB

Rainer B. Bertrams, P.O. Box 7646, Houston, Tex. 77270

Filed Jul. 30, 1982, Ser. No. 403,574
Int. Cl.³ B63B *21/16*
U.S. Cl. 114—254 18 Claims



1. A marine oil and gas geophysical exploration apparatus comprising in combination

a ship having upper and lower, spaced decks with longitudinally extending openings along the sides of the rear portion thereof,

a pair of jibs supported between said decks at the rear of said ship and pivotally movable between a first position between said decks and a second position extending laterally outward from each side of said ship,

a plurality of reels of cable supported along the length of each jib for releasing the cables in parallel relation,

motor means for separately rotating said reels,

an oil and gas geophysical exploration device removably supported on the end of each cable, and

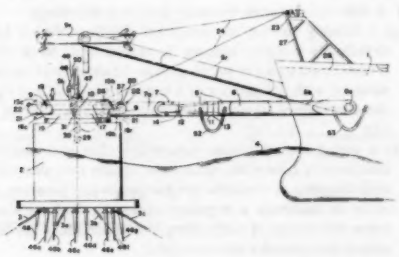
means comprising a trolley supported beneath each jib for movement longitudinally thereof for moving a geophysical exploration device longitudinally along each jib to a position aligned with each of said reels for removing or installing said geophysical exploration devices from or on the ends of said cables.

4,480,575

DEVICE FOR RAPIDLY MOORING A FLOATING INSTALLATION TO AN ANCHORED MARINE INSTALLATION

Guy R. Delamare, Herblay, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 22, 1982, Ser. No. 391,026
Int. Cl.³ B63B *21/52*
U.S. Cl. 114—230 17 Claims



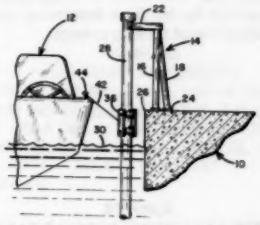
1. In a device for rapidly mooring a floating installation (1) to a floating marine installation (2) fastened to at least a fixed point at the bottom of the ocean to which said floating installation (1) is connected by means of a rigid arm (5), one of the extremities of said arm (5) being connected to the floating installation (1) at an articulated connection (8, 8*a*) having a substantially horizontal axis, and the other extremity of said arm (5) carrying connecting means (9), the improvement wherein said connecting means (9) is equipped with guiding means (15, 16) cooperating externally around with a circular rolling pathway (17) on the marine installation, said pathway being eventually located out of water and separating means for temporarily pulling way (21, 22) the guiding means (15 to 15*j*; 16 to 16*j*) carried by the connecting means (9) from the rolling pathway to permit effecting of bringing along side of the floating installation to the floating marine installation, and then for retaining said connecting means (9) on said rolling pathway (17) after the lowering of the rigid arm (5) to achieve said mooring, and for freeing of said connecting means (9) to permit the raising of the rigid arm (5) when the floating installation is to be released from the marine installation (2).

4,480,576

BOAT MOORING APPARATUS

Robert J. Mills, 5327 Osceola Ct., Brooksville, Fla. 33526

Filed Feb. 22, 1983, Ser. No. 468,390
Int. Cl.³ B63B *21/00*
U.S. Cl. 114—230 5 Claims



1. Boat mooring apparatus allowing vertical movement of the moored boat comprising:

(a) at least two elongated cylindrical posts;

(b) vertically upward extending tripod means for each cylindrical post for attaching said post in a vertical disposition at predetermined spaced-apart locations along the edge of a dock or pier with one end of the post extending a predetermined distance below the water's surface;

(c) said tripod means including legs fastened to a horizontal surface of said dock or pier along an edge thereof adjacent to the location where the boat is to be moored, bracket means and means to pivotally connect the post to the tripod;

(d) a first and a second carriage, one for each cylindrical post each having roller means slidably cooperating with the exterior surface of a respective one of said posts for vertical motion therealong; and

(e) tie lines joining each of said carriage assemblies to the boat being moored, said tie lines limiting lateral movement of said boat relative to said dock or pier.

4,480,577

WATER SKI APPARATUS

Frank R. Naypaver, 351 Florine Ave., Warren, Ohio 44430

Filed Sep. 13, 1982, Ser. No. 416,928
Int. Cl.³ B63B *21/56*
U.S. Cl. 114—253 7 Claims

1. A water ski training aid apparatus for use with a boat, comprising:

a rigid mounting plate attached on the exterior hull of a boat on one side thereof and above the water level,

said plate having means extending laterally outwardly thereon defining a horizontal pivot connection extending substantially fore and aft of the boat and parallel to the boat longitudinal axis when said plate is secured thereon,

an elongated bar, said bar having one end thereof provided with attachment means for said plate horizontal pivot connection with the remainder of said bar extending laterally outwardly therefrom, thereby to permit said bar to swing substantially vertically up and down with respect to said mounting plate, and,

flexible cable means connectable between a point on said bar outwardly thereof from said pivot connection and a point

above said mounting plate thereby to restrain downward free swinging movement of said bar while permitting substantially unrestrained upward swinging thereof, whereby a training water skier when towed by said bar may pivot said bar vertically upwardly and downwardly as the boat may roll about its longitudinal axis, and thereby prevent the bar from descending into the water with resultant loss of training control.

4,480,578

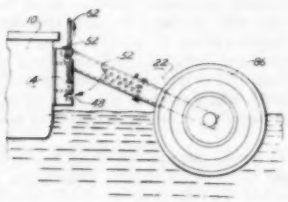
BRACKET FOR ATTACHING DEMOUNTABLE PARTS TO VEHICLES AND THE LIKE

Franklin D. Fisher, 113 Maple Ct., Buchanan, Mich. 49107, and Kenneth W. Clark, 6889 Curtis Dr., Coloma, Mich. 49038

Filed Sep. 16, 1982, Ser. No. 419,088

Int. Cl.³ B63B *21/64*

U.S. Cl. 114—344 **9 Claims**



1. A wheel and mounting bracket assembly for boats and the like, comprising a wheel support having a vertically positioned shaft-like strut with a pair of spaced pins extending laterally therefrom, a bracket having a body with upper and lower ends and with side walls having vertical outer edges and forming a generally U-shaped elongated channel for receiving said strut in parallel relationship therewith, spaced pairs of upper and lower opposed slots in said side walls in the outer edge thereof for receiving said pins on said strut, said upper pair of opposed slots of said side walls being of an L-shaped configuration and being disposed near the upper end of said body and intersecting the outer edges of said vertical walls and said lower pair of opposed slots being of a straight configuration extending horizontally inwardly from said outer edges and disposed downwardly from said upper pair of opposed slots, a latch means having a longitudinally moveable bolt for locking the pin received in said straight slot in seated position therein, and a means for securing said body to a supporting member.

4,480,579

KAYAK WITH ADJUSTABLE ROCKER

William E. Masters, P.O. Box 64, Liberty, S.C. 29657

Filed Jul. 14, 1982, Ser. No. 398,205

Int. Cl.³ B63B *35/72*

U.S. Cl. 114—347 **14 Claims**

1. A rotationally molded kayak having a hull with a top, a bottom, a central portion, a bow portion, and a stern portion, said hull having a longitudinal curve, said longitudinal curve defining the rocker of said kayak, the improvement comprising:

means connected to said hull and extending from a central portion in said hull to one end of said hull for increasing or decreasing the longitudinal curvature of said hull thereby adjusting the rocker of said kayak, said rocker adjustment means comprising means for raising or lowering the entire end of said kayak to which said means is connected relative to the central portion of said kayak.

4,480,580

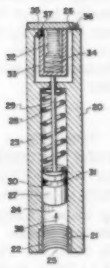
LOW TIRE PRESSURE WARNING DEVICE

Henry Nalence, Box 490, R.D. #1, Lambertville, N.J. 08530

Filed Jan. 24, 1983, Ser. No. 460,744

Int. Cl.³ B60C *23/04*; **F16K** *37/00*

U.S. Cl. 116—34 R **10 Claims**



1. A low tire pressure warning device, comprising:

(a) a housing having an elongated chamber which has a detachably mounted closure thereon, a first end of which is connected to a tire valve so as to be capable of communication with the interior of a tire and a second and opposite end thereof capable of communication exterior of said tire;

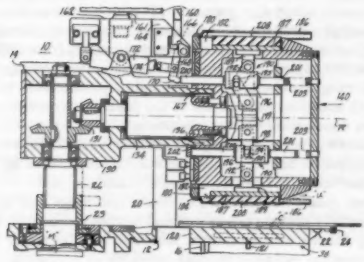
(b) a spring-loaded piston mounted within said chamber, functionally connected so as to be axially movable within said chamber in response to changes in tire pressure, and so as to motivate a streamer upwardly and outwardly upon movement of said piston in response to a predetermined tire pressure decrease; and,

(c) a spring-mounted, colored warning streamer located within said second end of said chamber and capable of being mounted in a compacted fashion therein, said streamer being connectively related to said spring-loaded piston and capable of being spring motivated to stream out of said chamber, as a warning signal, in response to axial piston movement in response to a predetermined tire decrease in pressure.

4,480,581
DEPOSITION APPARATUS

Robert C. Simmonds, Jr., Topsfield; Andrew J. Gilbride, Swampscot, and John F. Martin, Essex, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Dec. 27, 1982, Ser. No. 451,919
Int. Cl.³ C23C *13/08*; B05C *1/00*
U.S. Cl. 118—50 **11 Claims**

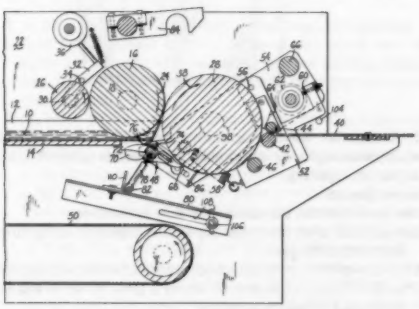


1. A machine for operaing on a fusible powder for a substrate, comprising:
- a frame member;
- an annular receiving surface rotatably disposed in a horizontal manner in a journal in said frame member;
- means for intermittently rotating said annular receiving surface;
- means for intermittently depositing a configuration of powdered material on said annular receiving surface in between successive periods of rotative advancement of said receiving surface;
- means for intermittently treating said deposited powder to transform said powder into a fused three-dimensional configuration thereof; and
- means for intermittently withdrawing said fused configuration from said annular receiving surface in between successive periods of rotative advancement of said receiving surface.

4,480,582
ADHESIVE APPLYING APPARATUS

Charles Schaefer, Captains Dr., Westbrook, Conn. 06498

Filed Apr. 13, 1983, Ser. No. 484,482
Int. Cl.³ B05C *1/12*; B05D *1/40*
U.S. Cl. 118—245 **12 Claims**

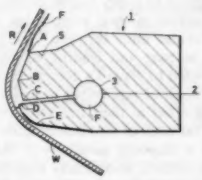


1. In an apparatus for applying adhesive to sheet materials having a coating roller, means for applying adhesive to the coating roller, a feed roller to feed the sheet material into tangential contact with the coating roller thereby transferring the adhesive to the surface of the sheet material, and stripping means for stripping the adhesive coated sheet material from the coating roller, the improvement comprising:
- a main support means mounted for rotation about the axis of the coating roller from a first operating position to a second cleaning position;
- the feed roller being mounted on the main support means for movement therewith; and
- the stripping means being mounted on the main support means for movement therewith, whereby the stripping means and the feed roller may be rotated around the axis of the coating roller as the main support means is rotated to provide access for cleaning.

4,480,583
COATING APPARATUS

Yasunori Tanaka, and Shinji Noda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 6, 1982, Ser. No. 447,375
Claims priority, application Japan, Dec. 16, 1981, 56-201484
Int. Cl.³ B05C *5/02*
U.S. Cl. 118—410 **14 Claims**



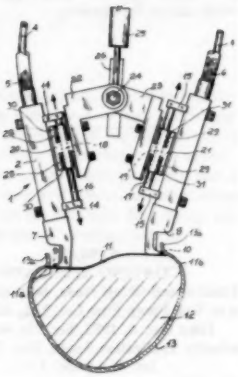
1. An extrusion coating apparatus having front-most surfaces disposed closest to a flexible support (W), comprising:
- a coating source (3);
- a doctor edge surface (5) and a back edge surface (6) each of which confronts said flexible support which is continuously transported in a vicinity of said surfaces, said doctor edge surface being disposed on a downstream side of a longitudinal slot (4) and said back edge surface being disposed on an upstream side of said longitudinal slot, said longitudinal slot extending along a widthwise direction of said support and being in communication with said coating source,
- said doctor edge surface having a front-most downstream edge A, a front-most upstream edge C and a front-most intermediate edge B disposed between said downstream and upstream edges, said upstream, downstream and intermediate edges extending along said widthwise direction of said support;
- said back edge surface having a front-most downstream edge D and a front-most upstream edge E which also extends along said widthwise direction of said support;
- said doctor edge surface and said back edge surface being formed such that in cross-section an angle ∠ABC is less than an angle ∠ABD which is less than 180°, and an upstream angle between a line A–B and a tangent line which is tangent to said front-most downstream edge D of said back edge surface being greater than an upstream angle between a line B–D and said line A–B.

4,480,584

DEVICE ADAPTED TO APPLY THERMOPLASTIC CEMENT PARTICULARLY FOR ASSEMBLING SHOE VAMP SIDES

Celeste Cucchetti, and Pietro Cucchetti, both of Vigevano, Italy, assignors to O.R.M.A.C. S.p.A. dei F.LLI CUCCHETTI & CO., Vigevano, Italy

Filed Dec. 6, 1983, Ser. No. 558,623
Claims priority, application Italy, Dec. 24, 1982, 23798/82[U]
Int. Cl.³ B05C *5/02*
U.S. Cl. 118—411 **4 Claims**



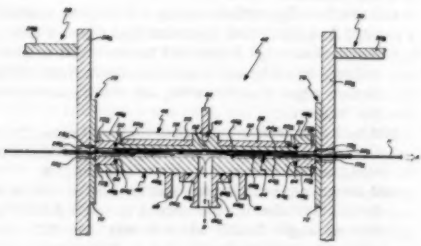
1. A device adapted to apply thermoplastic cement particularly for the assembling of shoe vamp sides, of the kind comprising a pair of heater units through which a thermoplastic thread is caused to pass and leading to respective cement-applying feet intended to spread a cement coat on the edges of a shoe insole and a pair of supporting arms for said heater units connected to each other at their free ends by means of a pin, characterized in that each of said heater units is provided with a slide bar which is disposed parallelly to the axis of its own heater unit and is slidably and axially engaged within a slide hole obtained in a small block carried by the corresponding supporting arm of the heater unit, said supporting arms being fixedly mounted with respect to each other on a pin that can be disposed at a predetermined height above the insole on which said cement must be spread.

4,480,585

EXTERNAL ISOLATION MODULE

David A. Gattuso, Pontiac, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 23, 1983, Ser. No. 506,960
Int. Cl.³ C23C *13/10*
U.S. Cl. 118—719 **21 Claims**



1. An external isolation module for use with deposition apparatus adapted to deposit semiconductor material onto a substrate; said deposition apparatus including: a plurality of chambers through which the substrate is moved, and into at least one of which reaction materials are introduced; and means for maintaining the chambers at sub-atmospheric pressures to form a multi-chambered vacuum envelope; said isolation module, which is adapted to operatively interconnect at least one pair of adjacent chambers, comprising;

passageway means including a pair of spacedly positioned passageway-forming members (1) through which a substrate is adapted to pass, and (2) which is adapted to substantially prevent the reaction materials introduced into one of the pair of interconnected chambers from diffusing into the adjacent chamber; at least one of said passageway-forming members being removably positionable to provide access to the interior of the passageway means without dissassembly of the chambers;

connecting means adapting the isolation module for external disposition between, and operational securement to, each chamber of the pair of adjacent chambers; and

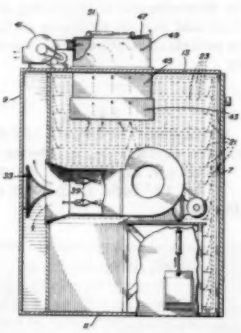
sealing means adapted to provide a leak-proof seal to substantially prevent environmental contaminants from entering the vacuum envelope, whereby the externally-interconnected isolation module provides an accessible, environmentally-sealed, reaction material-isolating passageway between the pair of adjacent chambers.

4,480,586

CHAMBER FOR VAPOR IMMUNIZATION OF CHICKENS OR THE LIKE FOWLS

Gérald Laguë, Terrebonne; Roman Baldur, Baie d'Urfé; Paul Marois, Montréal; Maurice Brossard, St-Lambert; Marc Quevillon, Anjou; Enrico Di Franco, Laval-des-Rapides, and Robert Dugré, Laval, all of Canada, assignors to I.A.F. Production Inc., Laval-des Rapids, Canada

Filed Sep. 13, 1982, Ser. No. 417,572
Int. Cl.³ A01K *1/03*; A61D *7/00*
U.S. Cl. 119—15 **9 Claims**



1. A chamber for use in immunizing chickens or the like fowls by treating same with a vaccine which is sprayed in said chamber, comprising:

an enclosure;

stacks of chicken containers for said enclosure;

said chicken containers having means enabling air to circulate therethrough;

a blower-motor combination mounted between two opposite walls of said enclosure, to direct a flow of air towards a third wall of said enclosure;

a first stack of chicken containers piled on one side of said enclosure, and a second stack of chicken containers piled on the other side of said enclosure, said first and second stacks of chicken containers being spaced from one another to define a central alley, said blower-motor combination being disposed in said central alley;

deflecting cone means mounted on said third wall to deflect said flow of air and to cause said air to circulate uniformly through said chicken containers;

means for spraying said vaccine in said flow of air, said vaccine thereby being inhaled by said chickens, resulting in vaccination of said chickens through their respiratory tracts;

suction means to remove air from said enclosure when said chickens are being vaccinated, thereby to maintain a negative pressure of air inside said enclosure;

means associated with said suction means to prevent any discharge of viral particles to the outside atmosphere, when air is being removed from said enclosure;

means to control the pressure inside said enclosure at a predetermined level which is lower than atmospheric pressure, and which is sufficient to prevent viral particles containing air from leaking to the outside;

means for flushing said enclosure when vaccination is terminated and previously to opening said enclosure to remove said chickens therefrom, while preventing viral particles from being thrown into the outside air;

lateral doors provided at the base and towards the front of said enclosure, and remote means of opening and closing of said lateral doors;

a pressure gauge indicating the difference of pressure between the inside and outside atmosphere; and

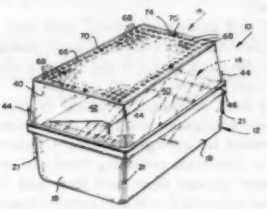
and remote means enabling the control means to close simultaneously as said lateral doors are being opened and vice versa.

4,480,587

ANIMAL CAGE ASSEMBLY WITH REUSABLE FILTER CAP

Robert S. Sedlacek, Stoneham, Mass., assignor to Lab Products, Inc., Maywood, N.J.

Filed Sep. 23, 1982, Ser. No. 422,355
Int. Cl.³ A01K *1/03*
U.S. Cl. 119—15 **9 Claims**



1. A filter cap for an open-top animal cage, comprising:

a rigid body portion sized to fit upon and cover over the open top of said cage, said body portion having continuous, unbroken side and end walls, an open top end and an open bottom end,

detachable air filter means extending across the entire open top end of said filter cap body portion,

said air filter means comprising a sheet of filter material sized to fit closely within the open top end of said body portion, a rigid perforated protective plate overlying said sheet of filter material and of substantially the same size and shape as the latter, and a support structure including a plurality of cross arms underlying said sheet of filter material,

means for detachably securing said filter means to said body portion in a mounted position in which said filter means covers over the open top end of said body portion with said sheet of filter material sandwiched between said rigid perforated plate and said support structure,

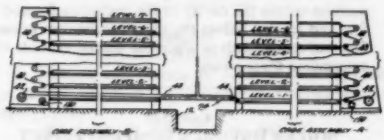
flange means extending around the periphery of the open bottom end of said body portion and including a lateral flange portion sized and positioned to rest upon the top surface of said animal cage when the filter cap is inserted thereon, to effect a substantial peripheral seal between said filter cap and said cage, and a continuous rigid skirt portion depending from said lateral surface and sized to closely encompass the open top of said cage such that said filter cap overhangs said cage and cannot be dislodged therefrom.

4,480,588

APPARATUS FOR RAISING POULTRY UTILIZING HIGH DENSITY BROODING

John H. Holliday, Winterville, Ga., and Robert V. Marlin, Red Bank, Tenn., assignors to Cumberland Corporation, Chattanooga, Tenn.

Filed Aug. 5, 1983, Ser. No. 520,833
Int. Cl.³ A01K *31/06*
U.S. Cl. 119—17 **27 Claims**



1. Apparatus for raising poultry during an initial grow-out period, comprising:

a pair of multi-tier cage assemblies positioned in spaced end-to-end relationship with respective tiers of the assemblies being located at corresponding levels, the tiers of each assembly being vertically spaced from one another by a distance limited to that sufficient to provide head room for a chick approximately three weeks of age;

a plurality of movable floors normally occupying respective tiers of said assemblies, but at least one of said assemblies having an unoccupied tier;

bridge means positionable between said assemblies to span the spacing therebeween, said bridge means being adjustable to extend between any tier of one assembly and a tier of the other assembly at the same or the next higher or lower level; and

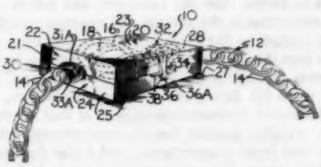
means for alternately moving floors in sequence, across said bridge means from one of said assemblies to an unoccupied tier of the other assembly, each of said floors being adapted to enter chicks within a cage assembly during its movement in one direction and to remove chicks from the cage assembly during its movement in the opposite direction.

4,480,589

SAFETY COLLAR DEVICE

Mitchell Schneider, 12050 Dodd Rd., Rosemount, Minn. 55068

Filed Apr. 27, 1983, Ser. No. 488,988
Int. Cl.³ A01K *27/00*
U.S. Cl. 119—106 **8 Claims**



1. A safety collar for an animal, the collar comprising:

a neck collar including a strand and first and second connecting means at each end of the strand connectable with each other to form a continuous collar loop; and

a safety enclosure enveloping the first and second connect-

ing means, the enclosure comprising first and second enclosure halves operable between an open and a closed position, means for positioning the first and second halves between the open and closed positions, and a clasp mechanism for retaining the first and second halves in a closed position, the first and second halves when in a closed position defining a cavity therebetween which is sufficiently large to conceal the first and second connecting means with at least one opening communicating with the cavity, the strand of the neck collar extending through the opening and wherein the opening is sufficiently small to prevent the first and second connecting means from exiting the cavity through the opening, the clasp mechanism having a predetermined force value for holding the first and second halves in a closed position that is less than the force an animal exerts in struggling for freedom when the collar is caught on a stationary object so that when the first and second connecting means are in a disengaged position within the cavity of the enclosure formed by the first and second halves the clasp mechanism releases the first and second halves when the animal exceeds the predetermined force value.

4,480,590

BOILER HAVING A PUMPING EFFECT

Geran Rhodin, Vēlundsgatan 8, S113 21 Stockholm, Sweden

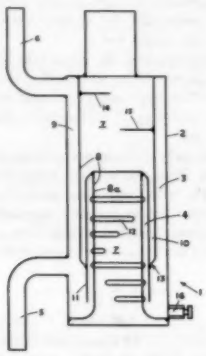
PCT No. PCT/SE81/00003, § 371 Date Sep. 18, 1981, § 102(e) Date Sep. 18, 1981, PCT Pub. No. WO81/02195, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 9, 1981, Ser. No. 305,646

Claims priority, application Sweden, Jan. 21, 1980, 8000478

Int. Cl.³ F22B *5/00*

U.S. Cl. 122—13 R **9 Claims**



1. A boiler having a pumping effect, comprising a casing (2) which includes an outer and an inner annular liquid compartment (3 and 4, respectively) the outer of which has a greater extent in height than the inner one and which communicate with each other at the bottom, and a supply pipe (5) connected at the bottom to the outer liquid compartment, at the top an outlet pipe (6) connected to said outer liquid compartment and a central through-going combustion chamber (7) to heat the inner walls (8), facing the combustion chamber, of the inner annular liquid compartment as well as that portion (9) of the outer, equally annular liquid compartment which extends above said inner compartment, said boiler further comprising partition means for separating the outer and inner annular liquid compartment (3 and 4 respectively), said partition means defining an annular space (10) between said outer and said inner compartments opening upwardly towards the combustion chamber, their being a cylindrical screen (11) depending from the partition into said bottom and wherein the wall of the inner liquid compartment (4) bordering on the combustion chamber (7) is provided with a number of rods (12) extending straight across the combustion chamber and being adapted to conduct to the wall the heat emitted from the combustion chamber, said supply pipe communicating with said outer compartment at the upper edge of said cylindrical screen to provide said pumping effect.

4,480,591

CONDENSING BOILER

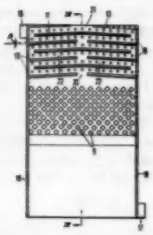
Jan H. Deckers, Tegelen, Netherlands, assignor to Beondu A.G., Vaduz, Liechtenstein

Filed Feb. 2, 1983, Ser. No. 463,127

Claims priority, application Netherlands, Feb. 2, 1982, 8200384

Int. Cl.³ F22B *7/00*

U.S. Cl. 122—14 **7 Claims**



1. A central-heating boiler made by casting of light metal, said boiler comprising:

a casting having exterior walls;

a flue positioned in said casting for the passage of flue gas;

a combustion chamber positioned in said casting, said combustion chamber passing into said flue at the top of said combustion chamber;

a water passage defined by said casting for cooling water to be heated;

a wall of said casting separating both said flue and said combustion chamber from said water passage, said water passage directing water in an opposite direction to the flow of said flue gas through said flue;

a primary heat exchanger disposed in said flue directly above and contiguous with said combustion chamber;

first extensions for enlarging a heated surface of said flue, said first extensions extending from said wall separating said water passage from said flue, said first extensions extending into said flue in said primary heat exchanger for absorbing heat from said flue gas, said flue gas rising generally vertically from said combustion chamber to said primary heat exchanger;

a secondary heat exchanger disposed in said flue directly above and contiguous with said primary heat exchanger;

second extensions for enlarging the heated surface of said flue, said second extensions extending from said wall separating said water passage from said flue, said second extensions extending into said flue in said secondary heat exchanger, said second extensions define at least one labyrinth path for said flue gas, said flue gas rising generally vertically from said primary heat exchanger to said secondary heat exchanger; and

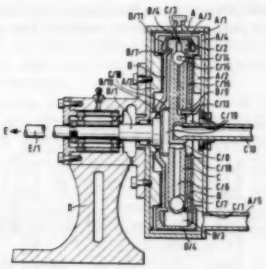
condensate discharge means defined by said exterior walls in said secondary heat exchanger for discharging moisture condensed from said flue gas through said exterior walls, the moisture being condensed from said flue gas by being exposed to said second extensions extending into said secondary heat exchanger and said second extensions reducing the temperature of said flue gas to the extent that moisture contained therein is condensed and collected one said second extensions until the condensed moisture flows to said condensate discharge means.

4,480,592

DEVICE FOR CONVERTING ENERGY

Mehmet R. Gökcen, Esentepe, Emekli Subay Evleri 17 Blok, Daire 9, Gayrettepe, Istanbul, Turkey

Filed Nov. 30, 1982, Ser. No. 445,450
Int. Cl.³ F22B *3/06*; F28C *3/00*
U.S. Cl. 122—26 **18 Claims**



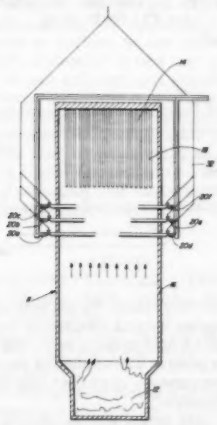
1. A device for converting the potential energy existing between the molecules of liquid into heat energy, comprising a body member for containing liquid, and means including a centrifugal energy drum mounted for rotation within said body member and adapted to receive liquid therein, and a channelled guide disc arranged within said drum, for imparting circular rotational movement to liquid contained in said drum and, by virtue of the cooperation of said drum and said channelled guide disc, for exerting, at various stages of said rotational movement, variable vacuum and pressure effects on the rotating liquid that heat the liquid.

4,480,593

METHOD AND COMPOSITION TO AVOID ASH BUILD-UP

David W. Robinson, Great Falls, Mont., assignor to Robinson Insulation Co., Great Falls, Mont.

Filed Jul. 9, 1982, Ser. No. 396,648
Int. Cl.³ F22B *37/18, 37/48*
U.S. Cl. 122—379 **9 Claims**



1. A vermiculite feed apparatus, for injecting vermiculite and hot gas into a containment vessel having boiler tubes therein and containing combustion gases therein, comprising:

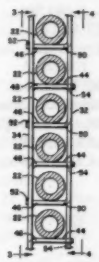
a housing having walls defining a passage therethrough, said housing having a distal portion for projecting into the gases of combustion and a proximal portion, said passage within said proximal portion of said housing including a narrow section, a tapered section having a cross-section of increasing diameter and a wide section, said narrow section for receiving hot gas under pressure and directing said hot gas into said tapered section, said tapered section further having an opening for communicating with a source of vermiculite and for withdrawing said vermiculite as high velocity hot gas is directed through said tapered section portion and into said wide section, said vermiculite mixing with said hot gas to exfoliate said vermiculite as said vermiculite and hot gas exit through said wide section of said proximal portion and out said distal portion of said housing into the combustion gases in the containment vessel for contact with the boiler tubes within the containment vessel.

4,480,594

ECONOMIZER SUPPORT

Robert P. Sullivan, and Francis B. Jackson, both of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 21, 1984, Ser. No. 581,847
Int. Cl.³ F28B *9/00*; F22B *37/24*
U.S. Cl. 122—510 **3 Claims**



1. In combination, a vertical gas pass through which hot combustion gases flow, a heat exchanger including a vertical tube panel having serpentine tube means, the tube means having a plurality of parallel, vertically spaced horizontal tube portions, support means for the tube panel, said support means including a pair of vertical plates, therebeing a first of the plates being on one side of the panel, and a second of the plates being on the other side of the panel, the first plate having a plurality of horizontal first bars integral at one end therewith, which extend beneath and support every other, or alternate horizontal tube portions, the other end of the first bars being supported by and welded to the second plate, and the second plate having a plurality of horizontal second bars integral at one end therewith which extend beneath and support the remaining, alternate horizontal tube portions not supported by the first bars, the other end of the second bars rests on and is supported by ledges on the first plate.

4,480,595

INTERNAL COMBUSTION ENGINE

William M. Hobby, 244 Sylvan Blvd., Winter Park, Fla. 32789, and Joseph M. Valdespino, 5023 Golf Club Pkwy., Orlando, Fla. 32808

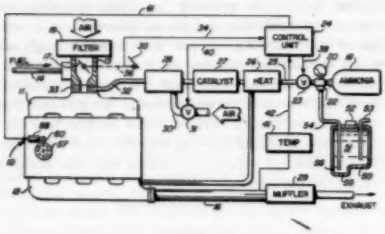
Division of Ser. No. 340,256, Jan. 18, 1982, Pat. No. 4,416,224. This application Nov. 7, 1983, Ser. No. 549,080
Int. Cl.³ F02M *25/12, 27/02*
U.S. Cl. 123—1 A **4 Claims**

1. An improvement in an internal combustion engine having an auxiliary fuel system for feeding an auxiliary fuel stored

under pressure to the internal combustion engine comprising in combination:

a storage tank for holding an ammonia under pressure;

a relief valve positioned on the outlet of said storage tank to relieve excessive pressure in said tank by releasing auxiliary fuel therefrom;



a container partially filled with water adapted to absorb said ammonia; and

a coupling attached to said relief valve and connected into said container whereby auxiliary ammonia released by said auxiliary fuel tank is captured in said container to prevent release thereof to the atmosphere.

4,480,596

MAGNETIC ELASTIC LUMBAR BELT

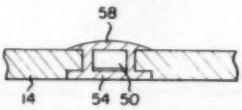
Noriaki Shumiyashu, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Apr. 20, 1979, Ser. No. 31,914

Claims priority, application Japan, Apr. 20, 1978, 53-51437[U]; Apr. 20, 1978, 53-51438[U]; Apr. 20, 1978, 53-51439[U]; Aug. 30, 1978, 53-118724[U]

Int. Cl.³ A61N *1/42*

U.S. Cl. 128—1.3 **10 Claims**



1. A magnetic elastic lumbar belt comprising an elongated elastic belt having a pocket with an opening therein, said pocket being positioned approximately at the center of the belt and means for looping the said belt at both ends thereof, a flexible sheet having a plurality of holes therethrough, removably inserted in said pocket through the opening therein, wherein each of said holes has a flange extending from the side of the hole towards the center thereof, a plurality of magnet capsule means each of which is removably engaged with the flange of said hole of the sheet, each of the magnet capsule means having a disk shaped permanent magnet and a flexible capsule surrounding the magnet, wherein said flexible capsule has a groove means therein for engaging said flange and wherein said magnet capsule means are removable from said sheet by deforming said flexible capsules surrounding the magnets.

4,480,597

TWO-STROKE CYCLE GASOLINE ENGINE

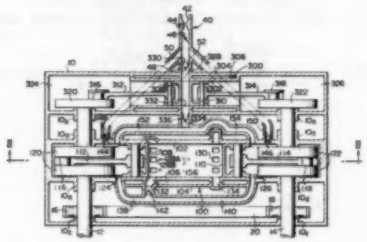
Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, and Isao Igarashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kobyo Kabushiki Kaisha, Japan

Filed Apr. 20, 1979, Ser. No. 31,739

Int. Cl.³ F02B *25/08*

U.S. Cl. 123—51 BA **7 Claims**

1. A two-stroke cycle gasoline engine, comprising a power cylinder-piston assembly including a scavenging port configuration having a first scavenging port configuration disposed generally along a first common plane normal to the axis of the power cylinder first uncovered by the power piston as it moves along the power cylinder from is top dead center to its bottom dead center and a second scavenging port configuration disposed generally along a second common plane normal to the axis of the power cylinder uncovered by the power piston as it moves from its top dead center to its bottom dead center immediately after said power piston has completed uncovering the first scavenging port configuration, wherein the general rate



relative to piston position in the power cylinder of uncovering the area of the first scavenging port configuration is several times smaller than that of the second scavenging port configuration, said first scavenging port configuration ejecting jet flows of scavenging mixture strong enough to generate turbulence in said power cylinder at an early stage of uncovering said scavenging port by said power piston even when said engine is at low load operation including idle, while said second scavenging port configuration provides openings large enough to complete scavenging of said power cylinder when said engine is at full load operation.

4,480,598

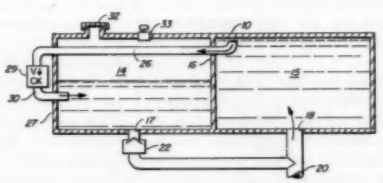
COOLANT RECOVERY AND DE-AERATION SYSTEM FOR LIQUID-COOLED INTERNAL COMBUSTION ENGINES

James H. Berrigan, Mesa, Ariz., assignor to William C. Neils, Phoenix, Ariz.

Filed Sep. 22, 1983, Ser. No. 534,316

Int. Cl.³ F01P *11/02*

U.S. Cl. 123—41.27 **14 Claims**



1. A coolant recovery system for use with the cooling system of a liquid-cooled internal combustion engine, having a cooling radiator and a filler opening on the top of the cooling system to provide positive anti-aeration of the engine cooling system and positive recovery of all fluid, said recovery system including in combination:

an accumulator tank means with an opening in the bottom thereof located with such opening above the cooling system filler opening;

first passage means including first check valve means therein for permitting free liquid flow from the opening in the bottom of said accumulator tank means to said cooling system filler opening and for blocking liquid flow from

said cooling system filler opening to said accumulator tank means through said first passage means;

a second passage separate from said first passage connected between the upper portion of said cooling system and said accumulator tank means;

a second valve means in said second passage for closing said second passage and adapted to open when the pressure in said cooling system exceeds a predetermined pressure greater than ambient atmospheric pressure to permit coolant liquid and gasses in the upper portion of said cooling system to flow into said accumulator tank means, said second valve means blocking flow of fluid from said accumulator tank means to said cooling system through said second passage;

filler opening means in said accumulator tank means for permitting the addition of coolant liquid thereto; and

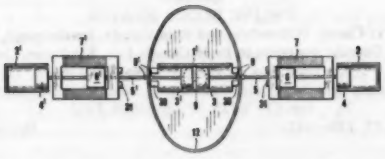
means for venting gasses in said accumulator to the atmosphere.

4,480,599

FREE-PISTON ENGINE WITH OPERATIVELY INDEPENDENT CAM

Egidio Allais, Corso Italia 15, Saluzzo, Italy

Filed Sep. 9, 1982, Ser. No. 416,959
Int. Cl.³ F02B *71/00*; H02K *57/00*
U.S. Cl. 123—46 R **9 Claims**



1. A free-piston internal combustion engine for actuation of an energy utilizer means having a reciprocable member, comprising: a supporting structure; at least one engine unit having two cylinders mounted on said structure opposite to one another, a piston mounted for reciprocation in each of said cylinders, and a piston rod connected to each said piston, an intermediate portion of said piston rod being connected to the reciprocable member of the utilizer means, and said piston rod having tappet means; at least one cam rotatably mounted on said structure and engaging said tappet means of the piston rod; and motor means in addition to said cylinders, said motor means operatively connected to said cam to rotate said cam independently of said cylinders and suitable for being controlled in substantial synchronism with the displacements of said piston rod; whereby during normal operation of the engine no subtantial transmission of energy takes place between the piston rod and the cam, whilst in case of anomalous operation of the free-piston engine the cam limits the stroke of the pistons and supplies to them from said motor means the energy required for the compression stroke.

4,480,600

COMPACT ODD CYLINDER V-TYPE ENGINE

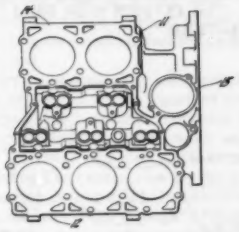
Lloyd T. Gill, Okemos, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 24, 1982, Ser. No. 381,075
Int. Cl.³ F02B *75/22*
U.S. Cl. 123—52 MV **6 Claims**

1. A compact internal combustion engine comprising

a frame supporting a crankshaft for rotation on a longitudinal axis and defining an odd number of cylinders arranged in two substantially straight banks of longitudinally aligned cylinders radiating in V fashion from a common axis, one of said cylinder banks being shorter and having one less cylinder than the other, the cylinder banks being arranged to leave a cylinder free space at one end of the shorter bank and in generally opposite lateral relation to one of the cylinders of the other bank,

pistons in the cylinders and connected with respectively aligned throws of the crankshaft for driving the pistons in timed reciprocating motion in the cylinders on a predetermined operating cycle, and



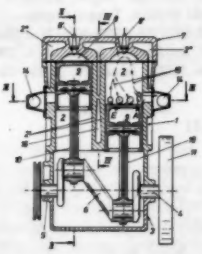
an engine driven mechanism connected with each of the cylinders and operative to time a repetitive function in the cylinders in relation to the engine operating cycle, said mechanism being disposed in said cylinder free space lying at said one end of the shorter cylinder bank and in generally opposite lateral relation to said one cylinder of the other bank, whereby a compact arrangement of the engine cylinders and associated mechanism is provided.

4,480,601

WATER-COOLED TWO-STROKE INTERNAL COMBUSTION ENGINE

Othmar Skatsche, and Gerhard Feichtinger, both of Graz, Austria, assignors to Avl Gesellschaft Fur Verbrennungskraftmaschinen Und Messtechnik m.b.H. and Prof.Dr.Dr.h.c. Hans List, both of Graz, Austria

Filed Dec. 21, 1983, Ser. No. 563,932
Claims priority, application Austria, Jan. 11, 1983, 82/83
Int. Cl.³ F02B *75/20, 75/18*; F01P *1/02*
U.S. Cl. 123—59 B **2 Claims**

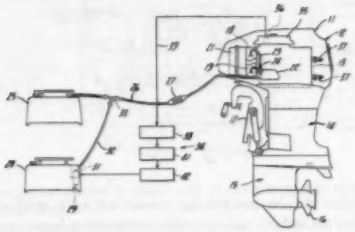


1. A water-cooled two-stroke internal combustion engine comprising two cylinders each having a water jacket, intake ports and exhaust ports and a piston which controls said ports, said intake ports being positioned on either side of said exhaust ports which in turn are located on front ends of the engine, said intake ports being directed towards longitudinal sides of the engine, and said cylinders having areas which do not have any of said ports, said areas being situated next to each other in the center of the engine, said engine further comprising fresh charge compartments located on either of said longitudinal sides and into which said intake ports open, and wherein a gap is provided between said port-free areas of said cylinders, which connects said water jackets of said two cylinders in the upper part and said two charge compartments in the lower part thereof.

4,480,602
LUBRICATING SYSTEM FOR TWO-CIRCLE INTERNAL COMBUSTION ENGINE

Yoshiaki Kobayashi, Hamamatsu, and Atsushi Mori, Iwata, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Jun. 21, 1983, Ser. No. 506,533
Claims priority, application Japan, Jul. 30, 1982, 57-132072
Int. Cl.³ F02B *33/04*; F01M *1/00*
U.S. Cl. 123—73 AD **7 Claims**

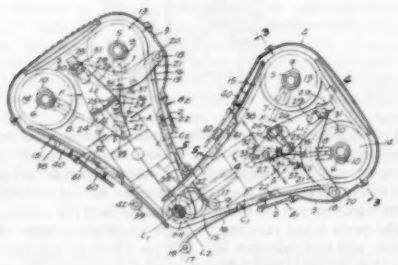


1. In a lubricating system for a two-cycle internal combustion engine operating over a range of speed and load conditions wherein the lubricant demands of the engine at a certain one of such conditions range from a maximum amount at the maximum anticipated of the other conditions and a minimum amount at the minimum anticipated other condition, said system comprising variable output lubricant delivery means for delivering lubricant to the engine, the improvement comprising means for sensing the one condition and control means for controlling the amount of output of said variable output lubricant delivery means, said control means providing a predetermined amount of lubricant between the minimum and maximum amounts in response to the sensed one condition.

4,480,603
CHAIN TIGHTENING MECHANISM FOR DOHC ENGINE

Masaharu Tsuboi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 350,068
Claims priority, application Japan, Feb. 20, 1981, 56-24648; Feb. 20, 1981, 56-24649; Mar. 27, 1981, 56-44796; Mar. 27, 1981, 56-44797
Int. Cl.³ F01L *1/04*
U.S. Cl. 123—90.31 **4 Claims**



1. In an internal combustion engine of the DOHC type having a driveshaft sprocket, spaced camshaft sprockets and an endless timing chain in a loop driven by the driveshaft sprocket and driving the camshaft sprockets, the loop thereby having a slack side and a tension side, the improvement comprising, in combination:

a tensioner body having a portion adapted to contact the slack side of the endless chain outwardly of the loop;

an arm member;

pivot means pivotally fixing said arm member at a stationary location inwardly of the loop, said tensioner body being pivotally connected to said arm member at a distance from said pivot means;

a rod pivotally connected to said arm member at a distance from said pivot means;

a rocking member pivoted at a stationary location inwardly of the loop and spaced from said pivot means, said rocking member including an opening slidably receiving said rod and permitting motion of the rod only in the direction away from said arm member; and

resilient means applying a bias force to said arm member for moving said arm member in a direction causing the tensioner body to maintain tension in the chain.

4,480,604
ENGINE BLOCK HEATER

Yih-Yi Chang, Willowdale, and Rein Kungla, Scarborough, both of Canada, assignors to Budd Canada Inc., Kitchener, Canada

Filed Nov. 2, 1982, Ser. No. 438,626
Claims priority, application Canada, Nov. 12, 1981, 389875
Int. Cl.³ F02N *17/06*; H05B *3/02*
U.S. Cl. 123—142.5 E **10 Claims**

1. A heater suitable for use in an automobile engine block, comprising:

a plug member having a heating element and an adjustable fastening means extending from one side thereof, said plug member adapted for insertion into an aperture of said block with said heating element extending into said block;

said fastening means passing through said plug member for adjustment from outside and said block;

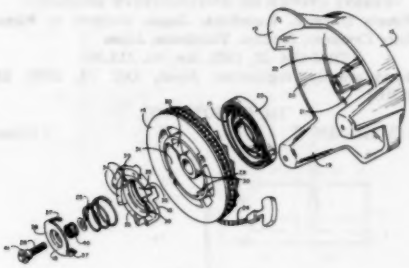
clamping means for securing said plug member in said aperture including a pair of wing members, and intermediate support member, said wing members each including at one end aligned apertures for cooperation with opposing protruding members of said support member so as to be pivotally movable from a first portion having an inverted V shape with respect to the one side of said plug member so as to facilitate insertion of said plug member into said aperture to a second position wherein said wing members extend substantially along a longitudinal path and have a transverse extent larger than that of said aperture for engaging a rear surface of the apertured block and means interconnecting said fastening means and said support member for drawing said support member and wing member from said first position to said second position.

4,480,605

RECOIL STARTER

James L. Bloemers, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 9, 1983, Ser. No. 492,930
Int. Cl.³ F02N 1/00
U.S. Cl. 123—185 BA 6 Claims



1. A starter mechanism for an internal combustion engine having a flywheel, said starter mechanism comprising:

(A) a starter housing mounted on said engine, said housing having a shaft coaxial with said flywheel;

(B) a pulley mounted for rotation on said shaft, said pulley having a ramp facing said flywheel;

(C) a drive plate mounted for rotation about said shaft and free to move axially along said shaft, said drive plate having an element constantly engaging said ramp; and

(D) a brake plate mounted on said shaft at a fixed axial position and frictionally engaging said shaft to resist rotation about the axis of said shaft, said brake plate having an element engaging said drive plate to resist rotation of said drive plate while allowing said drive plate to move axially;

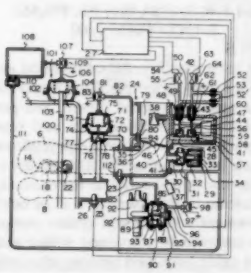
whereby when said pulley is rotated in a first direction said drive plate is moved axially along said shaft to engage said flywheel.

4,480,606

INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Shinichi Kato; Katsuhiko Motosugi; Masatami Takimoto; Haruo Yamada, all of Toyota; Kisaburo Mizuno, Aichi, and Mitsuyoshi Teramura, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 12, 1982, Ser. No. 433,902
Claims priority, application Japan, Oct. 14, 1981, 56-162675
Int. Cl.³ F02M 7/00; F01L 3/00
U.S. Cl. 123—188 M 27 Claims



1. An internal combustion engine comprising:

a helically-shaped intake port;

an intake passage connected to said intake port;

an exhaust passage;

a vacuum sensor arranged in said intake passage for detecting the level of vacuum in said intake passage;

an oxygen concentration detector arranged in said exhaust passage for detecting whether the air-fuel ratio of mixture fed into the engine from said intake port is larger or smaller than the stoichiometric air-fuel ratio;

an air-fuel ratio control device arranged in said intake passage for controlling the amount of fuel and air fed into said intake passage; and

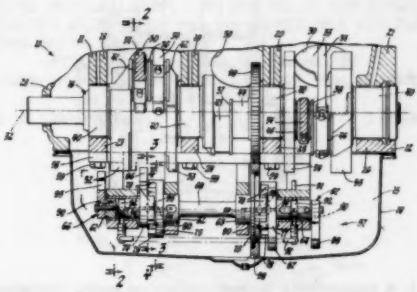
an electronic control unit controlling said air-fuel ratio control device in response to output signals of said vacuum sensor and said oxygen concentration detector for feeding a first lean mixture into the engine when said level of vacuum is in the range of about −500 through −250 mmHg; for feeding a fuel mixture having the stoichiometric air-fuel ratio into the engine when said level of vacuum is in the range of about −250 through −100 mmHg; and for feeding a rich mixture into the engine when said level of vacuum is smaller than about −100 mmHg.

4,480,607

BALANCER FOR 90 DEGREE V6 ENGINES AND THE LIKE

Lung-Wen Tsai, Troy, and Robert L. Jacques, Livonia, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1983, Ser. No. 519,018
Int. Cl.³ F16F 15/26
U.S. Cl. 123—192 B 6 Claims



1. A 90° V-6 internal combustion engine having cylinder banks with pistons connected by connecting rods to dual offset pins of three longitudinally spaced throws of a rotatable crankshaft, the pins of each throw being offset 30° and the engine being timed to provide equal firing intervals between cylinders, the piston-crank mechanism causing a mechanical imbalance comprising an eccentric primary rotating unbalance couple turning in the direction of crankshaft rotation and an eccentric secondary rotating unbalance couple turning opposite the direction of crankshaft rotation, both unbalance couples having smaller moment axes lying in a first longitudinal plane spaced equally between the cylinder banks and having larger moment axes lying in a second longitudinal plane normal to said first plane, and the improvement comprising

balancing means for the engine including the combination of balance weights on the crankshaft and separate balancer means attached to the engine and rotatably driven at crankshaft speed in opposite rotational direction from the crankshaft,

said crankshaft balance weights being sized and positioned to offset a portion of the primary rotating unbalance couple equal in magnitude to the smaller moment of the first

plane plus one half the difference between the larger and smaller primary unbalance couple moments, and

said separate balancer means comprising a pair of Oldham coupler balancers, each having a pair of end members connected by a coupler member and all rotatable together on spaced parallel axes at identical driven speeds whereby each coupler member orbits in a path through the axes of its connected end members at twice the driven speed,

said Oldham coupler balancers being spaced longitudinally of the engine with said rotational axes parallel to the crankshaft and having eccentric balance weights rotatable with at least one of the end members of each balancer,

said end member balance weights being selected and positioned to offset the remaining primary unbalance couple in the second plane and the excessive balancing couple in the first plane to provide complete balance of primary couples, and

said coupler members having appropriate mass and following orbital paths selected to offset a portion of the engine secondary rotating unbalance couple.

4,480,608

RECIPROCATING INTERNAL COMBUSTION ENGINE AND SUPPORT ASSEMBLY

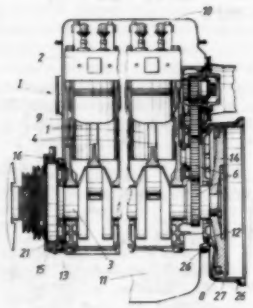
Assen Valev, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Mar. 18, 1982, Ser. No. 359,279

Claims priority, application Austria, Mar. 31, 1981, 1487/81

Int. Cl.³ F02B 77/00

U.S. Cl. 123—195 C **5 Claims**



1. A reciprocating internal combustion engine comprising the combination of

(a) an engine block including cylinders, at least one cylinder head, a crankshaft, connecting rods connected to the crankshaft, a camshaft, camshaft driving gears operatively connecting the crankshaft and camshaft, and intake and exhaust manifolds communicating with the interior of the cylinders;

(b) a flywheel non-rotatably connected to the crankshaft at a first end of the engine block;

(c) a housing accommodating the flywheel and rigidly connected to the first end of the engine block to form a unit therewith;

(d) a multi-part sheath connected together and enclosing at least part of the engine block, the sheath having a first end at the first end of the engine block and a second end at the second end of the engine block, and the sheath defining a common oil chamber around the engine block;

(e) respective sealing rings securing the first and second ends of the sheath to respective ends of the engine block each continuously encircling the crankshaft and insulating against structure-borne sound;

(f) a crossbeam disposed at the second end of the engine block, elastic means supporting the flywheel housing and engine block unit on the crossbeam and insulating against structure-borne sound, and driven engine accessories carried by the crossbeam; and

(g) laterally disposed, rubber lined bushings in said flywheel housing having support pins extending thereinto for supporting said flywheel housing and engine block unit.

4,480,609

FRONT COVER OF AUTOMOTIVE ENGINE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 20, 1981, Ser. No. 313,304

Claims priority, application Japan, Oct. 23, 1980, 55-151523[U]

Int. Cl.³ F02B 77/00

U.S. Cl. 123—195 C **7 Claims**

1. A front cover for covering moving parts located in the vicinity of the front surface of an internal combustion engine body for an automotive vehicle, said moving parts comprising interconnected moving gears,

said front cover comprising only a resin impregnated fibrous material which is high in vibration-damping capacity, said material being soft enough to prevent said cover itself from acting as a secondary noise source even upon receiving vibration from the engine body, said cover comprising a periphery, an elongate flange formed along the entire periphery of said cover, and means for producing a boltless attachment between said front cover and said engine body, said attachment means comprising a gasket adhered to said flange, said gasket having a surface containing adhesive and a removable paper protector over said adhesive, said protector being constructed so as to be removable leaving said adhesive exposed for attaching said front cover to said engine body only through said gasket and said adhesive.

4,480,610

REMOTE OIL LEVEL INDICATOR

Joseph B. Stinson, Fremont, Ohio, assignor to Joseph B. Stinson Co., Fremont, Ohio

Filed Feb. 3, 1984, Ser. No. 576,662

Int. Cl.³ F01M 1/00

U.S. Cl. 123—196 S **10 Claims**

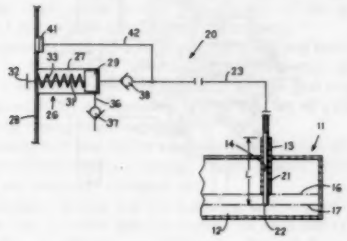
1. In a vehicle having an internal combustion engine, and a housing defining a reservoir therein, for a liquid lubricant, the housing having a guide tube fixed thereto and projecting inwardly thereof for communication with said reservoir, said guide tube being adapted to receive a conventional manually removable dipstick for indicating the full and low levels of the lubricant in the reservoir, and a system for remotely determining when the lubricant in the reservoir is at or below said low level, the improvement wherein said system comprises:

a sensing tube stationarily positioned within and extending through said guide tube, said sensing tube defining a passage therethrough which terminates in an opening at the lower end of said sensing tube, said lower end being disposed substantially at said low level so that said opening is

closed off by the lubricant in the reservoir when the lubricant level is above said low level;

elongated conduit means having one end at a remote location and the other end connected to the upper end of said sensing tube;

actuator means connected to the one end of said conduit means for rapidly supplying a determined mass of air through said conduit means to said sensing tube; and



indicator means for sensing the development of a pressure in said sensing tube due to said opening being closed by said lubricant so as to indicate that the level of lubricant in the reservoir is satisfactory and for sensing lack of said pressure when the lubricant level is low due to said lower end not being closed off by lubricant.

4,480,611

INTERNAL COMBUSTION ENGINE USING SEVERAL KINDS OF FUELS, WITH ELECTRONICALLY ADJUSTABLE INTAKE AND EXHAUST VALVES AND INJECTION DEVICE

Hans J. Wendt, Harburger Str. 63F, D 2150 Buxtehude, Fed. Rep. of Germany

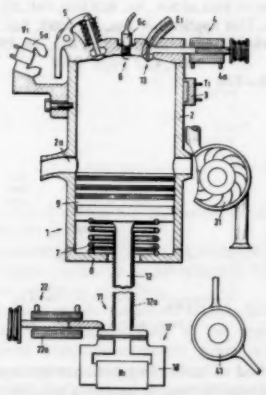
PCT No. PCT/DE80/00053, § 371 Date Dec. 20, 1980, § 102(e) Date Dec. 19, 1980, PCT Pub. No. WO80/02308, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 19, 1980, Ser. No. 227,076

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 3915927

Int. Cl.³ F02B *75/04*

U.S. Cl. 123—197 C **19 Claims**



2. An internal combustion engine capable of burning different types of fuels, said engine comprising:

at least one working cylinder (**1**, **1***a*) having a compression stroke and a power stroke;

an electronically controllable intake means (**5**) and an exhaust means (**2***a*) for said cylinder;

an electronically controllable fuel supply means (**4**) for said cylinder;

an electronically controllable ignition device (**6**) for said cylinder;

a piston (**9**) in said cylinder having power transmitting means (**12**, **12***a*) for connecting said piston to a driven shaft (**15**, **15***a*) and an electrical motor/generator (**24**), said piston having a compression energy-storing means operatively associated therewith for storing energy necessary for a compression stroke of the piston;

a cylinder temperature indicator (**3**);

a piston position indicator (**18**, **34**);

a programmable electronic control means (**20**) operatively connected with said temperature indicator (**3**), said piston position indicator (**18**, **34**), said intake valve means (**5**), said ignition device (**6**), and said fuel supply means (**4**); and

a circuit breaker (**25**) interposed between said electrical motor/generator (**24**) and said control means (**20**).

4,480,612

INTERNAL COMBUSTION ENGINE PROVIDED WITH A PLURALITY OF POWER UNITS

Toru Yamakawa, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

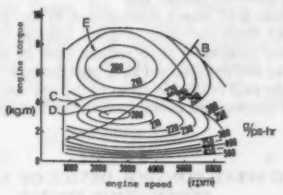
PCT No. PCT/JP81/00361, § 371 Date Jul. 29, 1982, § 102(e) Date Jul. 29, 1982, PCT Pub. No. WO82/01915, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 30, 1981, Ser. No. 403,739

Claims priority, application Japan, Nov. 29, 1980, 55-168781

Int. Cl.³ F02D *25/04*

U.S. Cl. 123—198 F **7 Claims**



1. An internal combustion engine for a vehicle, which comprises

a plurality of independent power units which are selectively used in accordance with driving conditions of the vehicle,

an output shaft,

a transmission operatively connected with the output shaft, said transmission having a plurality of selectively shiftable reduction gear ratios, at least one of said power units is operatively connected to the output shaft, clutch means for operatively connecting another of said power units to the output shaft,

gear ratio detecting means for producing a first output signal when a low reduction gear ratio of the transmission is selected,

engine load detecting means for producing a second output signal when the engine is operated at a light load, that a control circuit is provided to respond to both output signals from both the detecting means for producing an output signal which is applied to the clutch for disengaging it.

4,480,613

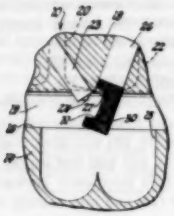
CATALYTIC LATE DIRECT INJECTION SPARK IGNITION ENGINE

Robert M. Siewert, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 319,143, Nov. 9, 1981, abandoned. This application Jul. 21, 1983, Ser. No. 516,183

Int. Cl.³ F02B *19/10*

U.S. Cl. 123—298 **8 Claims**



1. A catalytic late direct injection spark ignition internal combustion engine comprising

a closed-end cylinder having a piston reciprocably movable therein and defining at the cylinder closed end a variable volume combustion chamber,

intake means for the cylinder and operative to introduce fuel-free charging air into the combustion chamber,

fuel injection means in the cylinder and operative to direct an atomized fuel spray comprising the sole cylinder fuel charge into the air mass in the combustion chamber in a path to entrain and mix with the air during injection periods beginning near the end of each piston compression stroke,

spark ignition means in the cylinder in the path of the fuel spray and operative to cause a fuel igniting spark in the combustion chamber near the beginning of each injection period to ignite the passing mixture of injected fuel and entrained air and cause its continuing combustion during the injection period, and

catalytic grid means downstream in the path of the fuel spray from the point of spark ignition, said grid means being located so as to require most of the injected fuel spray and its entrained air to pass directly through the grid in the path of the fuel spray to thereby assist in completing the ignition and combustion of the fuel spray.

4,480,614

IDLING SPEED CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Mamoru Kobashi, Aichi; Shinichiro Tanaka, Toyota, and Hideo Saji, Aichi, all of Japan, assignors to Toyota Jidosha K.K. and Nippondenso Co., Ltd., both of, Japan

Continuation of Ser. No. 243,651, Mar. 13, 1981, abandoned. This application Apr. 26, 1983, Ser. No. 488,820

Claims priority, application Japan, Oct. 6, 1980, 55-14195[U]; Oct. 6, 1980, 55-141496[U]

Int. Cl.³ F02M *3/00*

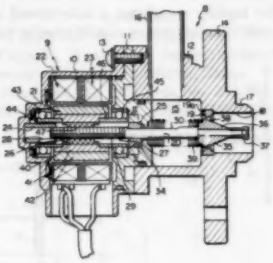
U.S. Cl. 123—339 **19 Claims**

1. An idling speed control device of an internal combustion engine having an intake passage and a throttle valve arranged in the intake passage, said device comprising:

a bypass passage interconnecting the intake passage located upstream of the throttle valve to the intake passage located downstream of the throttle valve;

valve means arranged in said bypass passage and having a control valve controlling a flow area of said bypass passage;

a step motor comprising a motor housing, a stator stationarily arranged in said motor housing, a rotor rotatably arranged in said motor housing, and a valve shaft axially movable in said motor housing and actuated by said rotor, said valve shaft being connected to said control valve for controlling the amount of air flowing within said bypass passage in accordance with a change in the operation condition of the engine at the time of idling; and



stop means restricting an axial movement of said valve shaft relative to said rotor, said stop means comprising at least one stop pin fixed on said valve shaft and projecting radially outwardly from said valve shaft, and at least one axially extending abutting face engagable with said stop pin and formed on an axial end of said rotor.

4,480,615

METHOD AND APPARATUS FOR CONTROLLING IGNITION TIMING IN A MULTICYLINDER INTERNAL COMBUSTION ENGINE

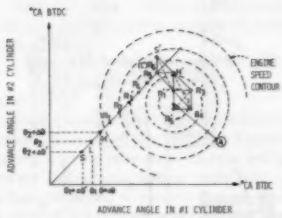
Yasuhito Takasu, Toyohashi; Shingo Inoue, Anjo, and Toshiharu Iwata, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 403,816, Jul. 30, 1982, Pat. No. 4,432,322. This application Jan. 20, 1983, Ser. No. 459,497

Claims priority, application Japan, Jan. 21, 1982, 57-8528

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—416 **10 Claims**



1. A method of controlling cylinder ignition timing in an internal combustion engine having a plurality of cylinders, comprising the steps of:

(a) operating said engine having a plurality of cylinders with various combinations of cylinder ignition timings to find any one of the following engine output parameters, speed, engine output torque and substitutes for engine output

torque obtained under each of said various ignition timing combinations;

(b) determining which one of said various combinations of cylinder ignition timings gives the lowest of said any one of the engine output parameters;

(c) setting a new combination of cylinder ignition timings in view of the ignition timing giving said lowest engine output parameter;

(d) operating said engine with said new cylinder ignition timing combination to find said any one of the engine output parameters which results therefrom;

(e) substituting said new cylinder ignition timing combination for the cylinder ignition timing combination giving said lowest engine output parameter so that said steps of (a) through (d) are executed with a new set of cylinder ignition timing combinations;

(f) repeating said step (e) for a predetermined period of time so that cylinder ignition timings for said plurality of cylinders are uniformly changed; and

(g) subsequent to said step (f), repeating said steps of (a) to (e) so that cylinder ignition timings for each one of said plurality of cylinders are differently changed from each other.

4,480,616

KNOCK CONTROL METHOD AND APPARATUS FOR AN INTERNAL-COMBUSTION ENGINE

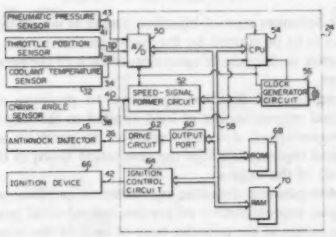
Keiso Takeda, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 25, 1983, Ser. No. 460,987

Claims priority, application Japan, Jan. 26, 1982, 57-9465

Int. Cl.³ F02P 5/14

U.S. Cl. 123—425 **15 Claims**



1. A knock control method for an internal-combustion engine, comprising the steps of:

detecting the operating condition of the engine to produce at least one engine parameter signal which is indicative of the detected operating condition;

in response to said engine parameter signal, discriminating whether the operating condition of the engine is in a predetermined knock-development range wherein the engine has a greater tendency to knock;

if it is determined that the operating condition of the engine is in said predetermined knock-development range, supplying an antiknock agent to the engine; and

after supplying the antiknock agent to the engine, advancing the ignition timing a predetermined time after the start of supplying the antiknock agent.

4,480,617

VALVE OPERATION CONTROL APPARATUS IN INTERNAL COMBUSTION ENGINE

Yoshikatsu Nakano, Kawagoe, and Masaaki Matsuura, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,528

Claims priority, application Japan, Nov. 11, 1981, 56-179583; Nov. 11, 1981, 56-179584; Nov. 11, 1981, 56-179585

Int. Cl.³ F02B 15/00

U.S. Cl. 123—432 **7 Claims**

1. A valve operation control apparatus for use in an internal combustion engine having a cylinder with at least two intake or two exhaust valve means, one of the two valve means includes a pause means for holding the valve means in a closed position, said control apparatus comprising a control circuit means operatively coupled to said pause means, said control circuit means having at least two open degree sensors responsive to two different degrees of opening of a throttle valve of the engine and at least two engine speed sensors responsive to two different speeds of the engine, wherein said control circuit means controls the operation of said pause means in response to predetermined combinations of the operation of said open degree sensors and said engine speed sensors.

4,480,618

APPARATUS FOR ENRICHING FUEL UPON ENGINE STARTING OPERATION

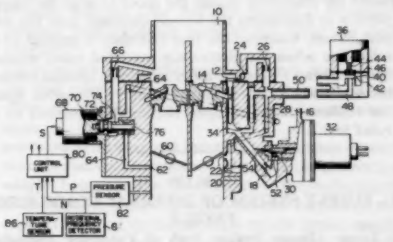
Hiroshi Kamifuji; Tomoo Ito, both of Katsuta; Haruhiko Kobayashi, Ibaraki, and Tomiya Itakura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Oct. 27, 1982, Ser. No. 436,943

Claims priority, application Japan, Nov. 2, 1981, 56-162713[U]

Int. Cl.³ F02M 7/00

U.S. Cl. 123—438 **17 Claims**



1. An apparatus for enriching an air-fuel mixture supplied by a carburetor to an internal combustion engine in the starting operation thereof, said apparatus being provided independent of main fuel supply system and comprising: a passage having an inlet communicated to a fuel supply source and an outlet opened at a position downstream of a throttle valve; means for controlling flow of the fuel fluid to be ejected from said outlet of said passage; arithmetic operational means for arithmetically

determining a product of a rotational frequency of said engine and a value which varies in dependence on a suction vacuum of said engine and correcting said product by a value which varies in dependence on the temperature of engine cooling water, to thereby produce a control signal, and means for driving said flow controlling means in accordance with said control signal produced by said arithmetic operational means.

4,480,619

FLOW CONTROL DEVICE

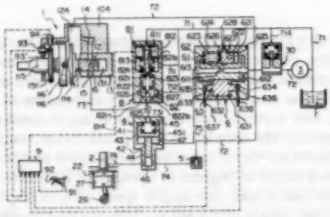
Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Toru Yoshinaga; Seiko Abe, both of Okazaki, and Kazuhide Watanabe, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 7, 1983, Ser. No. 501,788

Claims priority, application Japan, Jun. 8, 1982, 57-99031; Apr. 11, 1983, 58-62243; Apr. 11, 1983, 58-62244; May 16, 1983, 58-84050; May 16, 1983, 58-84051; May 16, 1983, 58-84052

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—446 **45 Claims**



1. A flow control device arranged between a high pressure line and a relief line for control of pressure in the high pressure line, said device comprising:

a means for defining a cylinder bore;

a spool axially movably arranged in the cylinder bore;

first and second chambers formed on opposite sides of the spool in said cylinder bore, the spool having a throttle for attaining a fluid connection between the first and second chambers;

an electrically operated valve means for selectively opening the first chamber to the relief line, the second chamber being always in connection with the high pressure line;

a relief port means located at an inner surface of the cylinder bore for opening to the relief line;

a means for defining a stopper portion adjacent to said relief port means; and

a means for resiliently urging the spool to abut the stopper portion to disconnect the second chamber from the relief port means, whereby the first chamber is opened to the relief line when the electrically operated valve means is open, causing a pressure difference to be created between the first and second chamber, to move the spool against the resilient means to open the second chamber to the relief line.

4,480,620

FUEL SUPPLY SYSTEM OF INTERNAL COMBUSTION ENGINE

Shoji Tange; Minoru Imajyo, both of Yokosuka; Ryuzaburo Inoue, Yokohama, and Yasuhiko Nakagawa, Kamakura, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 7, 1982, Ser. No. 415,026

Claims priority, application Japan, Oct. 26, 1981, 56-170897

Int. Cl.³ F02D *5/00*; F02M *31/00, 51/00, 39/02*

U.S. Cl. 123—478 **7 Claims**

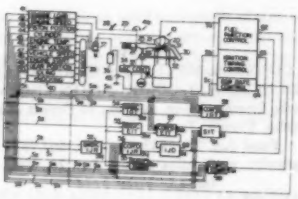
1. A fuel supply system of an internal combustion engine for an automotive vehicle including a power transmission system to be driven by the internal combustion engine, the internal combustion engine having an ignition system including a power source and being of the multiple-cylinder type having a plurality of power cylinders each including a combustion chamber and a piston movable in the bore in the cylinder, comprising

engine load detecting means operative to detect load on the internal combustion engine and to produce an output signal representative of the detected engine load;

an electrically-operated fuel-injection nozzle assembly projecting into a combustion chamber of a power cylinder of the engine and operative to inject fuel into the combustion chamber;

an electric control unit electrically connected to said engine load detecting means and said fuel injection nozzle assembly and operative to produce control signals to determine the durations of fuel injection and the fuel injection timings of said nozzle assembly on the basis of said control signals, the fuel injection timings being determined to occur in the presence of a gas pressure lower than the maximum gas pressure in the combustion chamber,

said electric control unit comprising fuel-injection duration calculating means electrically connected to said fuel-injection nozzle assembly and operative to determine an optimum duration of fuel injection and to produce output signals representative of the optimum duration of fuel injection, and start-of-injection timing calculating means electrically connected to said fuel-injection nozzle assembly and operative to determine an optimum start-of-injection timing and to produce output signals representative of



the optimum start-of-injection timing at which injection of fuel is to be started by the fuel-injection nozzle assembly during each cycle of operation of each of the power cylinders,

an engine-load detector operative to produce an output signal representative of load applied to the engine,

an engine-speed detector operative to produce an output signal representative of the revolution speed of the output shaft of the engine,

a piston-position detector operative to produce an output signal representative of predetermined axial positions of the piston in the cylinder bore of each of the power cylinders,

a cylinder detector operative to produce an output signal when the individual power cylinders of the engine reach said predetermined axial position by turns,

an engine-temperature detector operative to detect a temperature in the engine and produces an output signal variable with the detected temperature,

a battery-voltage detector operative to detect the voltage of said power source and produce an output signal variable with the detected voltage,

a vehicle-speed detector operative to detect the vehicle speed and produce an output signal variable with the detected vehicle speed,

an engine-start detector operative to detect the start of the engine and produce an output signal when the engine is cranked for starting,

a gear-position detector operative to detect a condition of

the power transmission system of the vehicle and produce an output signal representative of the detected predetermined condition of the power transmission system, and

an idling detector operative to detect an idling condition of the engine and produce an output signal in response to an idling condition of the engine,

said fuel-injection duration calculating means being operative to determine said optimum duration of fuel injection on the basis of the respective output signals from detectors selected from said engine-load detector, said engine-speed detector, said engine-temperature detector, said battery-voltage detector, said vehicle-speed detector, said engine-start detector, said gear-position detector and said idling detector, and

said start-of-injection timing calculating means being operative to determine said optimum start-of-injection timing on the basis of the respective output signals from detectors selected from said engine-load detector, said engine-speed detector, said piston-position detector, said cylinder detector, said engine-temperature detector, said battery-voltage detector, said vehicle-speed detector, said engine-start detector, said gear-position detector and said idling detector.

4,480,621

CONTROL APPARATUS FOR A FUEL METERING SYSTEM IN AN INTERNAL COMBUSTION ENGINE

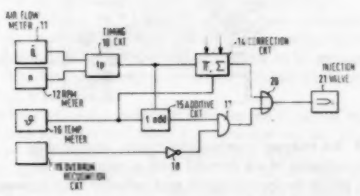
Rainer Höppel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 469,607, Feb. 24, 1983, abandoned, which is a continuation of Ser. No. 209,346, Nov. 21, 1980, Pat. No. 4,387,687. This application Mar. 30, 1984, Ser. No. 594,443

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 2948867

Int. Cl.[3] **F02B** *3/02, 3/00*

U.S. Cl. 123—493 **5 Claims**



1. A method for managing fuel in an internal combustion engine having an injection signal operated fuel control means and signal generating means responsive to rpm, air flow rate and a temperature sensing means for generating injection signals for operating said fuel control means, comprising the steps of,

multiplicatively correcting said injection signals for an enrichment fuel injection during engine warm-up dependent on said temperature sensing means,

additively correcting said injection signals during engine warm-up,

detecting an engine overrunning condition, and blocking said additively corrected injection signals while operating said fuel control means during an engine overrunning condition.

4,480,622

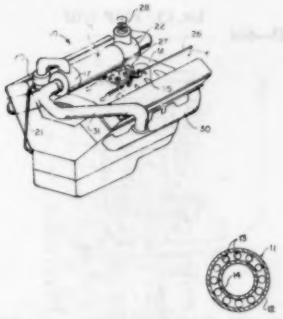
FUEL VAPORIZER

Paul H. Hoffman, 18003 NW. 78th Ave., Hialeah, Fla. 33015

Filed Sep. 21, 1983, Ser. No. 534,409

Int. Cl.[3] **F02M** *31/00*

U.S. Cl. 123—557 **1 Claim**



1. A fuel vaporizer for an internal combustion engine, comprising:

an elongate, tubular heat exchange body formed of a thermally conductive material;

a longitudinally extending exhaust gas passage formed centrally through the body, and a plurality of smaller longitudinally extending fuel vaporizing passages formed through the body in parallel, concentric relationship around the central passage, all of said passages opening axially through the opposite ends of the body;

an inlet manifold connected with one end of the body, and an outlet manifold connected with the other end thereof, said inlet and outlet manifolds having centrally disposed, axially oriented exhaust gas inlet and outlet openings therein, respectively, for connecting the exhaust from an engine to the central passage for unimpeded flow of exhaust gas therethrough, said inlet and outlet manifolds further having annular chambers therein in communication, respectively, with the inlet and outlet ends of the fuel vaporizing passages, and a fuel inlet to the inlet manifold chamber and a fuel outlet from the outlet manifold chamber, said fuel vaporizing passages having a combined cross-sectional flow area approximately twice as great as the cross-sectional flow area of the fuel inlet, whereby vaporized fuel and air mixture is enabled to expand in said passages and the flow velocity thereof is decreased to promote heat exchange between the body and air/fuel mixture;

a fuel atomizer and air/fuel mixing means connected with the fuel inlet to the inlet manifold chamber to supply atomized fuel and air mixture to the fuel vaporizing passages;

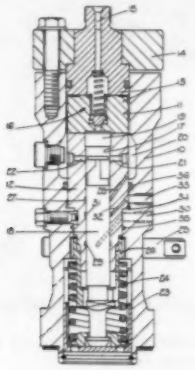
a combination adapter and butterfly valve means connected with the fuel outlet from the outlet manifold chamber, said adapter being constructed to attach to the intake manifold of an engine in place of the conventional carburetor and to support the heat exchange body on the intake manifold, whereby the heated, vaporized air/fuel mixture flows directly into the intake manifold of the engine while in its heated, vaporized condition and before cooling of the mixture can take place, said butterfly valve means being adapted to be connected to the throttle linkage of an engine on which the vaporizer is mounted for controlling the flow of heated air and vaporized fuel mixture to the intake manifold of the engine; and

a backfire relief valve on the outlet manifold in communication with the chamber therein for relief of pressure in the event of a backfire.

4,480,623
LIQUID FUEL INJECTION PUMP

Gerald S. Thomas, Gloucester, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Oct. 26, 1983, Ser. No. 545,673
Claims priority, application United Kingdom, Nov. 5, 1982, 8231661
Int. Cl.³ F01P 9/02
U.S. Cl. 123—514 **3 Claims**



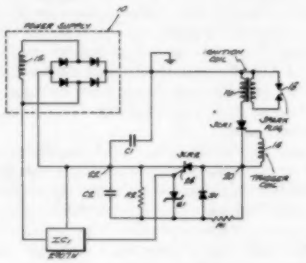
1. A liquid fuel injection pump for supplying fuel to an internal combustion engine comprising a body defining a stepped bore, a pump barrel located in said bore, a pumping plunger slidable in the bore and extending from one end thereof, a fuel supply gallery defined between the barrel and the body, a filling port in the barrel, said filling port opening into the bore at a position to be covered by the plunger during an injection stroke thereof, the filling port communicating with the fuel supply gallery, a first groove formed in the wall of said bore, said first groove communicating with said fuel supply gallery and acting to collect fuel at high pressure leaking along the working clearance between the wall of the bore and the plunger, a second groove formed in the wall of the bore, said second groove being axially spaced from the first groove between said first groove and said one end of the bore, passage means in the barrel and body connecting the second groove with a lubricating oil inlet on the body, said lubricating oil inlet, in use, being connected to a source of lubricating oil under pressure to ensure lubrication of the plunger and the wall of the bore, a third groove in the wall of the bore, said third groove being positioned between said first and second grooves, an outlet in the body and further passage means connecting said outlet with said third groove, said outlet in use being connected to a drain.

4,480,624
CAPACITOR DISCHARGE IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Philip A. Anderson, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 17, 1983, Ser. No. 523,614
Int. Cl.³ F02P 1/00
U.S. Cl. 123—602 **4 Claims**

1. A capacitor discharge ignition system for an internal combustion engine, said system comprising an ignition circuit path including, in series, a charge capacitor, a primary ignition coil, a first semi-conductor switch having a first control element, and a second semi-conductor switch having a second control element, means including a trigger coil connected to said first control element and a magnet rotatable relative to said trigger coil for applying a trigger voltage to said first control element to render conductive said first semi-conductor switch, a resistor-capacitor time-delay circuit connected to said circuit path between said first and second semi-conductor switches, a zener diode having a cathode connected to said resistor-capacitor time-delay circuit, and an anode connected to said second control element for applying a trigger voltage to said second control element to render conductive said second semi-conductor switch after a predetermined time-delay, and

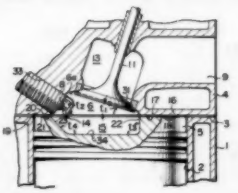


means connected to said second control element in parallel with the connection of said anode of said zener diode and responsive to engine speed for applying a trigger voltage to said second element to render conductive said second semi-conductor switch so as to advance the spark timing at a predetermined speed.

4,480,625
INTERNAL COMBUSTION ENGINE WITH HELICAL INTAKE PORT AND COMBUSTION CHAMBER WITH TWO SQUISH AREAS

Mutsumi Kanda; Kiyoshi Nakanishi, and Takeshi Okumura, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 22, 1982, Ser. No. 421,302
Claims priority, application Japan, Sep. 28, 1981, 56-154417
Int. Cl.³ F02B 23/08
U.S. Cl. 123—661 **6 Claims**



1. An internal combustion engine, comprising:
a cylinder block formed with a cylinder bore;
a piston reciprocating in said cylinder bore between a lower position and a top dead center position and formed with a piston crown; said piston crown being formed with a piston crown recess and with the rest of its surface substantially planar and perpendicular to the central axis of said cylinder bore, said piston crown recess having an inclined side surface on one side thereof, a side surface on an opposite side thereof having a generatrix which is substantially parallel to the central axis of said cylinder, and a planar bottom surface which is substantially parallel to said rest of the piston crown surface;
a cylinder head closing one end of said cylinder bore, a combustion chamber surface of said cylinder head lying proximate to said piston crown surface when said piston is at its said top dead center position; said combustion chamber surface of said cylinder head being formed with a wedge shaped cylinder head recess which has on its one side closer to said one side of said piston crown recess a

steeply inclined roof surface and on its other side a gently inclined roof surface and with the rest of its surface substantially planar and perpendicular to the central axis of said cylinder bore; said gently inclined roof surface being formed with an intake opening, and said cylinder head being further formed with a helical type intake port opening to said intake opening; and

a spark plug mounted in said steeply inclined roof surface of said wedge shaped cylinder head recess with its tip portion positioned close to a plane of said substantially planar surface of said cylinder head;

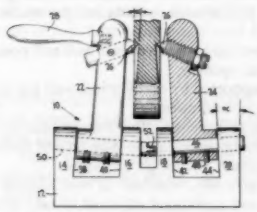
wherein, when said piston is positioned at its said top dead center position, said planar surface of said piston crown and said planar surface of said combustion chamber surface of said cylinder head mutually define a relatively large squish area on the side of said gently inclined roof surface of said wedge shaped cylinder head recess with edge portions of said two planar surfaces located opposite said spark plug and substantially coinciding with each other and a relatively small squish area on the side of said steeply inclined roof surface of said wedge shaped cylinder head recess with edge portions of said two planar portions located close to said spark plug and substantially coinciding with each other.

4,480,626

DEVICE FOR DRESSING GRINDING WHEELS

Ibrahim Ibrahimpasic, 1566 Scott St., San Jose, Calif. 95126

Filed Oct. 22, 1982, Ser. No. 436,071
Int. Cl.³ B25B *53/00*
U.S. Cl. 125—11 DF **12 Claims**



1. A device for dressing grinding wheels comprising:

(A) A base having two pairs of spaced-apart upstanding supports, each support of each pair having a surface facing the other support, said base being adapted to be disposed on a flat, horizontal support surface, proximate to said grinding wheel;

(B) A holder pivotally mounted between each pair of supports with its pivot axis being in a common vertical plane with the axis of rotation of said grinding wheel;

(C) A dressing tool mounted in each said holder and protruding therefrom such that said dressing tool contacts the side of said grinding wheel;

(D) Said holders being adapted to pivot such that said dressing tools describe an arc along said side of said grinding wheel from the peripheral edge, when said holders are pivoted downwardly, to the region adjacent to the central hub, when said holders are disposed essentially vertically;

(E) The facing surfaces of each said pair of supports being tilted toward said grinding wheel by a predetermined angle from the vertical corresponding to the desired dressing angle of the grinding wheel whereby said holders, when they are pivoted, simultaneously move axially toward and away from said wheel; and

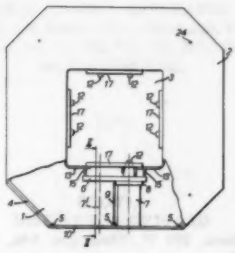
(F) Said pairs of holders being so spaced apart that they can receive said grinding wheel between them, whereby both sides of said grinding wheel may be dressed simultaneously.

4,480,627

DEVICE FOR DEMOLISHING CONCRETE PILES

Aart van der Toorn, Voorburg, Netherlands, assignor to Persluchtcentrale Nederland B.V., Leiden, Netherlands

Filed Jul. 8, 1982, Ser. No. 396,300
Int. Cl.³ B28D *1/32*
U.S. Cl. 125—23 R **8 Claims**



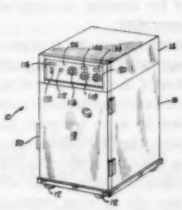
1. A device for breaking-up concrete piles comprising a housing having two relatively parallel plates with central holes defining a passage for a concrete pile together with screening plates mounted between said parallel plates and in front of supporting plates connecting the parallel plates near said holes, the members interconnecting said parallel plates near the outer circumference of said parallel plates, hydraulic rams each being fixed with one end to a supporting plate, chisels displaceable by said rams in the longitudinal direction of said rams towards and away from a pile located in said passage in directions being at an angle to each other, the chisels being passed through openings in said screening plates matching the cross-sections of the chisels.

4,480,628

FUEL EFFICIENT OVEN

Thomas W. Simpson, Rochester, Mich., assignor to Solaronics, Inc., Rochester, Mich.

Filed Dec. 13, 1982, Ser. No. 448,975
Int. Cl.³ A21B *1/00*; F24C *1/00*
U.S. Cl. 126—21 A **9 Claims**



1. A portable oven heating unit comprising:

means defining first and second chambers sealed from each other and having a common boundary for conduction of heat between said chambers;

a gas fired burner positioned to radiate energy into the first of said chambers, said burner producing a heated effluent which flows through said first chamber to an exhaust;

heat transfer elements coupled to said common boundary in said first chamber such that radiant heat from said burner as well as convection heat from said effluent heats both said elements and said boundary;

a first fan for moving gas to be combusted and air to said burner and moving effluent and air through said first

chamber to promote heat transfer from said effluent and air in said first chamber to said heat transfer elements and said boundary; and

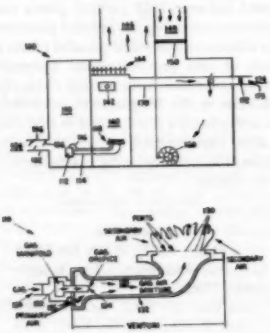
a second fan to promote heat transfer away from said boundary through said second chamber by moving air into contact with said boundary.

4,480,629

GAS FURNACE SYSTEM

Michael Williams, 193 W. Muskegon Ave., Cedar Springs, Mich. 49319

Filed Aug. 15, 1983, Ser. No. 523,667
Int. Cl.³ F24H *3/00*
U.S. Cl. 126—99 R **10 Claims**



1. A furnace system adapted for use with a substantially clean burning fuel for heating an internal environment, the furnace system comprising:

means for supplying fuel to the furnace system;

combustion means mounted at least partially within a combustion chamber of the furnace system for mixng the fuel and air supplied to the combustion means, and for burning the fuel mixture so as to generate heat energy, thereby heating air within the combustion chamber;

exchanger means spatially coupled to the combustion chamber and responsive to heating of air within the combustion chamber to heat air flowing externally around the exchanger means;

warm air duct means spatially coupled to external surfaces of the exchanger means for supplying air heated by the exchanger means to the environment to be heated;

air flow means spatially coupled to the warm air duct means for forcing the air to be heated around the external surfaces of the exchanger means;

cold air duct means for returning cold air from the environment to be heated; and

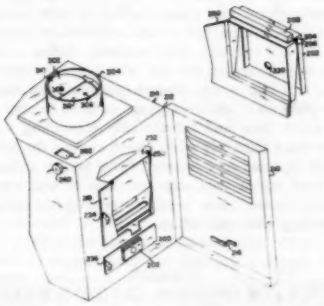
exhaust duct means having one end spatially connected to the combustion chamber and an opposing end spatially open to the environment to be heated for providing a spatial opening through which warm exhaust air from the combustion chamber can be supplied from the environment to be heated.

4,480,630

JACKETED COMBUSTION TYPE HEATER WITH BLOWBACK PREVENTION FEATURE

Murray O. Wilhoite, Huntsville, Ala., assignor to Martin Industries, Inc., Florence, Ala.

Division of Ser. No. 42,559, May 25, 1979, Pat. No. 4,320,739.
This application Mar. 11, 1982, Ser. No. 357,100
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.³ F23L *3/00*
U.S. Cl. 126—287 **1 Claim**



1. A combustion type heater comprising:

an enclosed firebox formed by a plurality of walls;

one of said walls, being vertical, having first and second openings therein, said first opening being a larger, upper, opening, and said second opening being a smaller, lower, opening;

a first door supported by said vertical wall and positioned to cover said first opening;

a second door supported by said vertical wall and positioned to cover said second opening;

a plenum around said firebox, other than around said vertical wall, and forming between said plenum and firebox an air space, said plenum having air openings;

an outer door pivotally attached to said plenum about a vertical axis and positioned adjacent to said openings in said firebox and outwardly spaced from said second door a discrete distance when said outer door is closed, and which permits access to said first and second doors; and

a third opening, in said second door, and a third door pivotally mounted along a horizontal pivotal axis on said second door and a weight attached to said third door and positioned to rotate said third door to a normally open position, and an arm attached to and extending from said outer door and positioned to engage said third door and rotate it closed about said pivotal axis when said outer door is closed, whereby, when said outer door is rotated in an open position, said third door is opened, preventing blow back.

4,480,631

APPARATUS FOR DELIVERING HEATED FLUID MEDIUM

Henning Kristensen, 12 Mitchell Ave., East Brunswick, N.J. 08816

Filed Nov. 4, 1982, Ser. No. 439,304
Int. Cl.³ F24H *1/20*
U.S. Cl. 126—360 R **5 Claims**

1. Apparatus for delivering heated fluid medium, comprising:

(a) an upstanding casing;

(b) a first compartment in said casing;

(c) a heat generator in said first compartment;

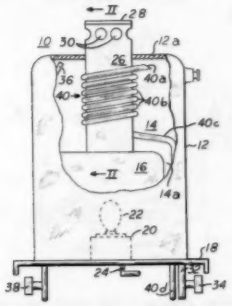
(d) a second compartment in said casing formed by the outer

surface of said first compartment and upper interior surface of said casing for releasably containing said medium;

(e) an output heat funnel communicating with and extending from said first compartment through said second compartment and exiting said casing;

(f) conduit means having an inlet port in the vicinity of said upper interior surface of said second compartment for receiving said medium therein, said conduit means circumscribing said funnel in said second compartment and having an outlet port issuing exteriorly of said casing and disposed vertically below said inlet port, said conduit means being disposed exteriorly of said first compartment; and

(g) means disposed in said funnel and in registry with said second compartment for after-burning of combustion products of said heat generator in said funnel.



4,480,632

LIGHT TRANSMISSIVE INSULATION APPARATUS

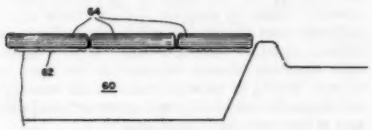
Shimon Klier, Simtat Magal 4, Savyon, and Ofer Novik, Rehovot, both of Israel, assignors to Shimon Klier, Savyon, Israel

Filed Mar. 30, 1982, Ser. No. 363,451

Claims priority, application Israel, Mar. 30, 1981, 62528; Aug. 27, 1981, 63678

Int. Cl.³ F24J 3/02

U.S. Cl. 126—415 **9 Claims**



1. Thermal insulation suitable for use along a solar radiation incident surface of a solar pond containing a pond liquid and comprising:

a plurality of transparent enclosures arranged to be disposed on a surface of a solar pond;

at least one layer of insulative beads disposed within said enclosures;

said at least one layer of insulative beads defining a plurality of barrier layers, separated from each other by insulating volumes defined by said insulating beads;

a liquid material of viscosity greater than the viscosity of the pond liquid arranged to fill the interstices between said plurality of enclosures;

said at least one layer of insulative beads defining said barrier layers being formed of a material selected from the following materials:

glass, fluoroplastics, acrylics and polycarbonate and being characterized by transmissivity to solar radiation and opacity to thermal infra-red radiation in the wavelength range of 6–20 microns;

said volumes defined by said insulative beads being characterized by low thermal conductivity and high transparency to solar radiation.

4,480,633

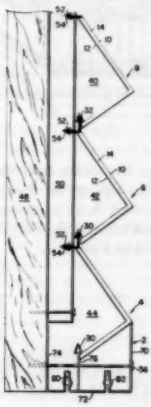
SOLAR ENERGY APPARATUS

Daniel L. Farrell, 328 Plumer Ave., Pittsburgh, Pa. 15202

Filed Jun. 7, 1982, Ser. No. 385,762

Int. Cl.³ F24J 3/02

U.S. Cl. 126—417 **15 Claims**



1. Apparatus for collecting radiant solar energy comprising

substrate means for securing solar panels directly or indirectly thereto,

at least one elongated translucent solar panel having a lower leg and an upper leg meeting at an apex disposed outwardly of said substrate means,

each said panel having an outer translucent wall and an inner translucent wall having at least a portion spaced from said outer walls,

end closure means cooperating with said panel to define a closed air space, and

means for securing said panels, whereby radiant energy impinging upon said solar panel will pass through said outer translucent wall, said closed air space and said inner translucent wall.

4,480,634

SOLAR COLLECTOR

Bernd Kellner, Oskar-Messter-Str. 16, D-8045 Ismaning, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,397

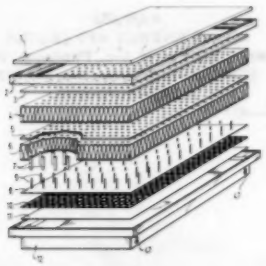
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214631

Int. Cl.³ F24J 3/02

U.S. Cl. 126—443 **6 Claims**

1. An evacuatable solar collector, comprising a collector tub, a radiotransparent pane sealingly covering the tub, an absorber arranged below the pane, and support members passing through the absorber and having a limited cross-section whereby, in the evacuated state of the collector, said support members support the pane in punctiform manner from the inside in places distributed over the surface area thereof, against the action of the external atmospheric pressure, wherein the support members in turn are supported against means engaging with the bottom of the collector tub and which bring about a distribution of the forces exerted by the support members on the tub bottom counteracting marking of

the latter, wherein the means comprise a metal sheet against which the support members are supported, and an insert provided between the metal sheet and the tub bottom, which forms spaces beneath the support points of the support members and which also has such a thickness in the direction of the forces exerted by the support members on the tub bottom, that the metal sheet bowing into the spaces under the influence of these forces does not contact the tank bottom, or only contacts it with a limited contact pressure.



4,480,635

SOLAR HEATER

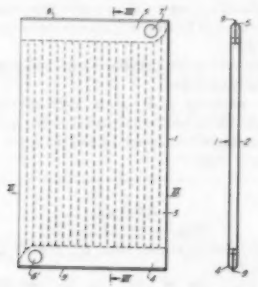
Izhar Ostrovsky, Kfar-Saba, Israel, assignor to Rav Shemesh B.M., Haifa, Israel

Continuation of Ser. No. 260,780, May 5, 1981, abandoned. This application Feb. 4, 1983, Ser. No. 464,016

Claims priority, application Israel, May 8, 1980, 60024

Int. Cl.[3] **F24J** *3/02*; **F24H** *0/00*

U.S. Cl. 126—445 **5 Claims**



1. A solar panel for absorbing solar energy and for transmitting the energy to a medium comprising two substantially continuous sheets, each of said sheets having a plurality of partition walls integral therewith, said partition walls on one of said sheets being aligned with said partition walls on the other of said sheets to form a plurality of channels adapted to carry said medium, and inlet and outlet manifolds for communicating with said channels, each manifold consisting of a chamber formed by removing portions of said partition walls and sealing edges of said two sheets together, and means for allowing said medium to flow into said inlet manifold and out of said outlet manifold, whereby each manifold is bounded at opposed ends by side portions of said sheets and along one side by said edges which have been sealed together.

4,480,636

ENDOSCOPE WITH IMAGE CORRECTION MEANS

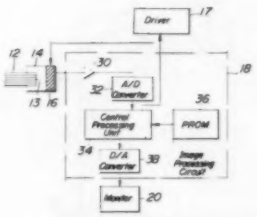
Kouichi Karaki, Hachioji; Kenichi Oinoue, Tokyo; Takashi Tsukaya, Hachioji; Katsumi Terada, Hachioji; Masafumi Yamasaki, Hachioji; Atsushi Yusa, Hachioji, and Kazuo Nakamura, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Jul. 6, 1982, Ser. No. 395,629

Claims priority, application Japan, Jul. 9, 1981, 56-107483

Int. Cl.[3] **A61B** *1/06*

U.S. Cl. 128—6 **21 Claims**



1. An endoscope apparatus for displaying an image of an object to be inspected comprising:

means including an image guide bundle having a plurality of optical fibers for transmitting the image of an object from a distal end to a light emitting end of the bundle;

means including a solid state, random access, nondestructive read-out image sensing device having a plurality of light receiving elements arranged to receive an image of an object transmitted through said bundle to produce a plurality of pixel signals;

memory means for storing at least one address of a light receiving element which corresponds to a part of said image guide bundle which does not transmit light effectively;

means for correcting a pixel signal of said light receiving element having its address stored in said memory means for producing a corrected pixel signal and for reconstructing a corrected image signal from said corrected and other pixel signals, said means for correcting including means for successively reading addresses of the pixel signals from the image sensing device, means for comparing each of said pixel signal addresses with the stored address in said memory means to produce a coincidence signal when such addresses correspond, means responsive to said coincidence signal for reading at least one pixel signal from a light receiving element adjacent to the light receiving element having its address stored in said memory means, and means for calculating said corrected pixel signal from said at least one pixel signal; and

monitor means for receiving the corrected image signal to display a corrected image of an object.

4,480,637

ORTHOPAEDIC APPLIANCE FOR USE IN TREATING FRACTURED CLAVICLES

Florian F. Florek, 104 High St., Edinboro, Pa. 16412

Filed Apr. 6, 1983, Ser. No. 482,405

Int. Cl.[3] **A61F** *5/40*

U.S. Cl. 128—94 **23 Claims**

1. For use in treating a patient having a clavicle fractured between its proximal end which is joined to the sternum and its distal end which is joined to the acromion overlying the humerus, a splint comprising:

a belt adapted to encircle the patient's abdomen below the rib cage transverse to the spinal column;

a strap having a pressure applying zone adapted to overlie the clavicle between its proximal end and the location of the fracture, said strap having an anterior portion depend-

ing diagonally downward from said pressure applying zone and across the patient's rib cage to a location adjacent said belt and to the side opposite the fractured clavicle, said strap also having a posterior portion depending diagonally downward from said pressure applying zone and across the patient's back to a location adjacent said belt on the side opposite the fractured clavicle;

means connecting said front and rear strap portions to said belt;

means for tensioning said strap to cause it to apply downward pressure to said clavicle between its proximal end and the fracture; and

sling means adapted to engage the patient's elbow and forearm and engaging over the patient's opposite clavicle for applying pressure upwardly via the humerus and acromion to the distal end of the clavicle;

whereby pressure is applied in opposite directions to the fractured clavicle for urging it into proper juxtaposition for promoting healing.

4,480,638

CUSHION FOR HOLDING AN ELEMENT OF GRAFTED SKIN

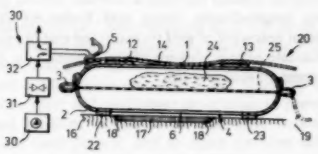
Eduard Schmid, Böheimstrasse 37, D7000 Stuttgart 1, Fed. Rep. of Germany

PCT No. PCT/DE80/00025, § 371 Date Nov. 9, 1981, § 102(e) Date Nov. 9, 1981, PCT Pub. No. WO81/02516, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 11, 1980, Ser. No. 321,169

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—155 **4 Claims**



1. A device for covering and applying pressure to a skin graft of a known size and shape and applied to a human body with normal skin surrounding the skin graft,

said device comprising a hollow inflatable generally pillow-shaped cushion having a first side wall made of a thin flexible sheet foil material for facing and engaging the human body,

said cushion having a second side wall made of a thin flexible sheet foil material and opposite from said first side wall for facing away from the human body,

said first and second side walls having joined peripheral portions and forming an interior space within said inflatable cushion,

said cushion and said first side wall thereof having an overall size and shape which is relatively substantially greater than the size and shape of the skin graft for overlying and protecting the skin graft and a portion of the surrounding skin,

said first side wall having an open cutout window therein having a size and shape relatively corresponding generally with the size and shape of the skin graft for producing open communication through said window between the skin graft and the interior space within said cushion,

the interior space within said inflatable cushion being in open communication with said skin graft through said open cutout window when said cushion is in its position of use,

said first side wall having a marginal portion surrounding said open cutout window and directed toward said window for engaging the surrounding skin around the entire skin graft,

first means for producing fluid-tight attachment of said marginal portion of said first side wall to the surrounding skin around the entire skin graft,

and second means for producing, maintaining and controlling fluid pressure within said cushion for inflating said cushion and exerting fluid pressure against the skin graft,

said marginal portion also being subject to the fluid pressure and being pressed against the surrounding skin by the fluid pressure when the cushion is in its position of use,

said cushion including a semipermeable partition within said cushion and dividing the interior space within said cushion into first and second compartments on opposite sides of said semipermeable partition,

said first compartment being in direct open communication with the skin graft through said open cutout window,

said second compartment being separated from said first compartment by said semipermeable partition whereby the only communication between the skin graft and said second compartment is through said first compartment and said semipermeable partition,

said cushion including a moisture binding agent contained within said second compartment for absorbing moisture evolved from the skin graft,

said semipermeable partition being permeable by moisture while preventing direct contact between said moisture binding agent and said skin graft.

4,480,639

MEDICAL TUBE RETAINING DEVICE

Edward D. Peterson, 1036 Glenhill Rd.; A. Dale Godfrey, 4909 Dehesa Rd.; Claire R. Douglas, 1353 Monument Hill Rd., all of El Cajon, Calif. 92020, and Carl R. Pennington, 1917 Maplebrook Ct., El Cajon, Calif. 92021

Continuation-in-part of Ser. No. 339,975, Jan. 18, 1982, abandoned. This application Sep. 27, 1982, Ser. No. 423,659

Int. Cl.³ A61M *25/02*

U.S. Cl. 128—207.18 **3 Claims**

1. A one piece device for positioning and retaining a nasal tube on the face of a patient, comprising:

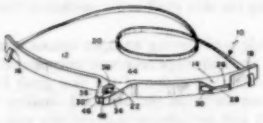
flexible straps means for positioning beneath the nose and extending to a point on each side of the face along the check of the user;

first tube clamp means on said strap means for positioning beneath the nose of the user and holding a tube extending from the nose of the user, said first tube clamp means including a block having a cutout portion for placing over the philtrum of the user, and a pair of outwardly extending fingers surrounding a tube receiving opening, the sides of said cutout portion being squeezable to open said fingers, and tension on the ends of said strap means tending to close said fingers;

the said tube receiving opening in said first tube clamp means is formed to accommodate tilting movement of said tube

forward and back and to restrict sidewise movement of said tube;

second tube clamp means on said strap means near one end of said strap means for gripping said tube along said strap



means, said second tube clamp means readily accommodating insertion and removal of said tube;

each end of said strap means being connectable to a holding means that positions around the head of the user to hold said strap means in position.

4,480,640

LIGATING DEVICE

Carl T. Becht, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Apr. 22, 1980, Ser. No. 142,676

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **10 Claims**

10. A surgical ligator to locate and clamp a substantially inverted U-shaped clip about a tubular member to close off the tubular member, said ligator comprising a magazine housing containing a supply of said clips, said housing at its distal end terminating in a forming portion having a forming jaw a first handle having a cooperating forming jaw, a second clip feeding handle, and means operative to sequentially clamp one of said clips between said forming jaws as said handles are actuated, open said forming jaws upon initial release of said first handle, and feed the next said clip into said forming jaws upon release of said second handle.

4,480,641

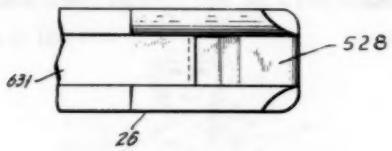
TIP CONFIGURATION FOR A LIGATING CLIP APPLIER

Stephen J. Failla, Chester, and Joseph D'Innocenzio, Kenilworth, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 5, 1982, Ser. No. 345,974

Int. Cl.³ A61B *17/12*; B21D *9/08*

U.S. Cl. 128—326 **3 Claims**



1. Jaw tips for a medical instrument for applying ligating clips comprising:

a right and left jaw disposed in confronting relationship and adapted to move together to close a clip about a vessel to be ligated, each of said jaws including:

a generally U-shaped channel having a first and second side wall and a base, the base of each jaw tapering toward the other as one advances in a direction toward the jaw tips from the body of said instrument when said jaws are in the fully opened position to partially close a clip as it is delivered to the jaw tips to assist in maintaining the clip within said U-shaped channels;

the distal end of each jaw tip including a recess for receiving a projecting portion of said clip and for retaining said clip projection therein during closing, thereby preventing said clip from receding into said U-shaped channels as it is closed about a vessel;

said recess including a first portion which undercuts the base of each said U-shaped channel, the base and the edge of the recess forming an acute angle to provide a stop for preventing the clip from receding from the jaws while it is being closed about a vessel to be ligated, the bottom of said recess extending longitudinally of its jaw a distance greater than the projecting portion of said clip to facilitate the entry of the projecting portion on said clip into said recess;

each said jaw tip further includes a planar exit portion stepped down below the plane of said U-shaped channel bases and extending from the distal end of each said recess to the distal end of each said jaw tip;

the inwardly facing, upper portion of each side wall of each said U-shaped channel includes a convex, curved portion extending longitudinally along said U-shaped channel from a point rearward of said recess to the end of each jaw tip to facilitate proper closure of the ligating clip despite misalignment of said jaw tips.

4,480,642

DILATION DEVICE FOR THE CERVIX

Vladimir A. Stoy, and George P. Stoy, both of Princeton, N.J., assignors to Health Products Research, Inc., Somerville, N.J.

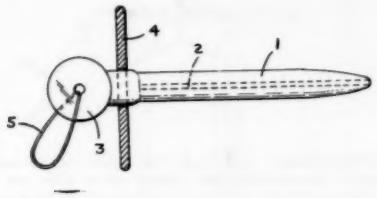
Filed Jul. 26, 1982, Ser. No. 385,894

Int. Cl.³ A61M *29/02*

U.S. Cl. 128—341 **14 Claims**

1. A device for dilation of a cervix by swelling comprised of an essentially cylindrically-shaped stem of 2 to 10 mm in diam-

eter and 35 to 150 mm in length, said stem formed of at least a major portion of a dehydrated hydrogen having a swelling



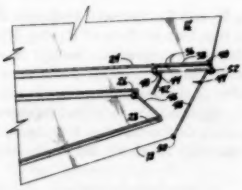
capacity of 0.01 to 0.25 and an enforced uniaxial deformation of at least 1.1.

4,480,643

SIEVE PLATE BAFFLE ATTACHMENT FOR GRAIN COMBINES

Arthur L. Alm, Griswold, Iowa, assignor to Murry W. Schuler, Griswold, Iowa, a part interest

Filed Jul. 14, 1982, Ser. No. 398,072
Int. Cl.³ A01F *12/32*
U.S. Cl. 130—24 **9 Claims**



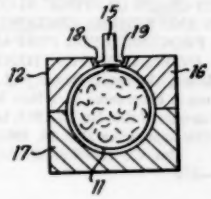
1. A grain harvesting machine, comprising,
a wheel supported body with a bottom portion and forward and rearward ends, and a grain harvesting means on the forward end thereof,
at least two parallel substantially horizontal spaced perforated upper and lower sieve plates adjacent the rearward end of said body above said bottom portion,
a grain plate positioned in spaced relationship between said lower sieve plate and said bottom portion,
said upper and lower sieve plates having rearward ends with the rearward end of said upper sieve plate extending rearwardly beyond the rearward end of said lower sieve plate,
fan means on said body adapted to direct air upwardly and rearwardly through said sieve plates to remove chaff from harvested grain on said sieve plates,
a first baffle means connecting the rearward ends of said grain plate and said lower sieve plate to prevent air from said fan from moving rearwardly from between the rearward ends thereof, and to cause air from said fan in between said grain plate and said lower sieve plate to move upwardly through said lower sieve plate towards said upper sieve plate,
a second baffle means secured to and extending downwardly from said upper sieve plate at a position rearwardly of the rearward end of lower sieve plate and forwardly of the rearward end of said upper sieve plate, said second baffle means extending downwardly below the level of the rearward end of said lower sieve plate to cause substantially the air moving upwardly through said lower sieve plate to move upwardly through said upper sieve plate forwardly of said second baffle means so as to minimize the upper movement of air through the rearward end of said upper sieve plate.

4,480,644

MANUFACTURE OF CIGARETTES

John A. Luke, Eastleigh, England, assignor to British-American Tobacco Company Limited, London, England

Filed Jul. 27, 1982, Ser. No. 402,253
Claims priority, application United Kingdom, Aug. 3, 1981, 8123699
Int. Cl.³ A24C *5/14*; A24D *1/02*
U.S. Cl. 131—68 **5 Claims**



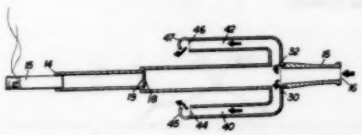
1. A method of manufacturing rod for cigarette use, wherein rod filler and paper wrapper web are fed continuously to a rod-forming device of a rod-forming machine whereby said wrapper web is wrapped about said filler to provide rod and said wrapper is longitudinally lap seamed without the application of an extraneous adhesive by bringing heated sealing means into contact with one of overlapping web portions intended to provide the seam, one at least of said portions comprising at least 50% by weight of thermoplastic fibres or filaments, whereby said heated sealing means effects heat-sealing of said overlapping portions.

4,480,645

SMOKING DEVICE

Randolph Albury, P.O. Box N. 7512, Nassau, The Bahamas

Filed Feb. 25, 1983, Ser. No. 443,648
Int. Cl.³ A24F *13/02*
U.S. Cl. 131—187 **3 Claims**



1. A smoking device comprising:
(a) a tubular body having an elongated configuration and being substantially hollow along the length of the interior thereof, an inlet formed at one end thereof and being sized to receive a cigarette in nested relation therein,
(b) an outlet formed in an opposite end of said tubular body relative to said inlet and in fluid communication therewith along said hollow interior,
(c) a first one-way valve disposed within said hollow interior between said inlet and said outlet and structured to regulate fluid flow in one direction, from said inlet to said outlet,
(d) a first port and a second port formed in said tubular body in spaced apart and substantially adjacent relation to one another along the length of said hollow interior between said first one-way valve and said outlet,
(e) a first and a second tubular length extending outwardly from said tubular body, each having a hollow interior disposed in fluid communication with said hollow interior of said tubular body via said respective ports,
(f) a second and a third one-way valve formed within said hollow interior of said first and said second tubular length respectively and each being structured to regulate fluid

flow in a single direction from said outlet to the exterior of said device through each of said tubular lengths via said respective ports, and

(g) whereby smoke drawn into said inlet is directed to said outlet and smoke exhaled into said device from said outlet is directed through said tubular lengths to the exterior of said device.

4,480,646

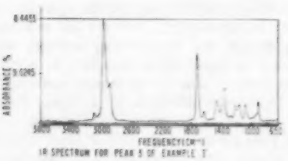
BRANCHED CHAIN OLEFINIC ALCOHOLS, THIOLS, ESTERS AND ETHERS, ORGANOLEPTIC USES THEREOF, PROCESSES FOR PREPARING SAME AND INTERMEDIATES THEREFOR

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

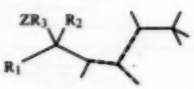
Continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Dec. 10, 1981, Ser. No. 329,223

Int. Cl.³ A24B *3/12, 15/30*

U.S. Cl. 131—276 **8 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco composition or a component of a smoking tobacco article comprising the step of adding to a smoking tobacco composition or a component of a smoking tobacco article an aroma or taste augmenting or enhancing quantity of at least one branched chain olefinic chalcogen derivative having the formula:



wherein Z represents oxygen or sulfur; wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bonds; wherein R_1 represents C_1–C_4 alkyl; R_2 represents C_1–C_4 alkyl; R_3 represents hydrogen, C_1–C_3 lower alkyl or C_1–C_3 lower acyl.

4,480,647

USE OF CYCLOHEXENYL-ALKYL ACROLEIN DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCO COMPOSITIONS AND SMOKING TOBACCO ARTICLES

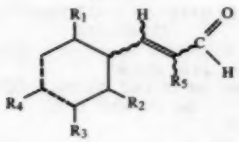
Mark A. Sprecker, Sea Bright, N.J.; Philip T. Klemarczyk, Newington, Conn., and Robert P. Belko, Woodbridge, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 398,953, Jul. 16, 1982, Pat. No. 4,424,379. This application Jun. 23, 1983, Ser. No. 507,176

Int. Cl.³ A24B *3/12*

U.S. Cl. 131—276 **11 Claims**

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of smoking tobaccos and smoking tobacco articles comprising the step of adding to said consumable material an aroma or taste augmenting or enhancing quantity of at least one aldehyde defined according to the structure:



wherein R_1, R_2, R_3 and R_4 represent hydrogen or methyl with the proviso that one, two or three of R_1, R_2, R_3 and R_4 represent methyl; wherein R_5 represents methyl or ethyl; wherein one of the dashed lines represents a carbon-carbon double bond and the other of the dashed lines represents a carbon-carbon single bond; wherein the wavy lines represent the "cis" or "trans" juxtaposition of the moieties hydrogen, R_5, cyclohexenyl and carboxaldehyde about the carbon-carbon double bond.

4,480,648

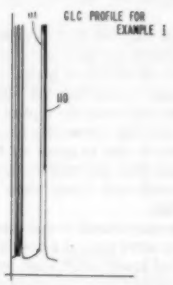
USE OF NORBORNYL ESTERS IN AUGMENTING OR ENHANCING THE AROMA OF TASTE OR SMOKING TOBACCO COMPOSITIONS AND SMOKING TOBACCO ARTICLES

Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

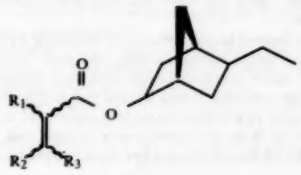
Division of Ser. No. 396,288, Jul. 8, 1982, Pat. No. 4,435,316. This application Jun. 23, 1983, Ser. No. 507,290

Int. Cl.³ A24B *3/12, 15/30*

U.S. Cl. 131—276 **8 Claims**



1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of smoking tobaccos and smoking tobacco articles comprising the step of adding to said consumable material an aroma or taste augmenting or enhancing quantity of at least one ester defined according to the structure:



wherein one of the dashed lines represents a carbon-carbon bond and the other of the dashed lines represents no bond; wherein the wavy lines represent a "cis" or a "trans" juxtaposition of the R_1, R_2, R_3 and carboalkoxy moieties around the carbon-carbon double bond; wherein R_1, R_2 and R_3 each represent methyl or hydrogen with the proviso that at least one of R_1, R_2 and R_3 is hydrogen.

4,480,649

FILTER DEVICE

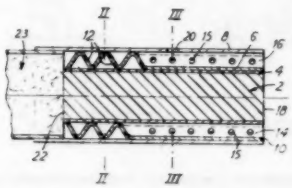
Ernest B. Hayes, 14 Heath Ct., Leighton Buzzard, Bedfordshire LU7 7JR, United Kingdom

Filed Jun. 23, 1982, Ser. No. 391,301

Claims priority, application United Kingdom, Jul. 6, 1981, 8120820

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—336 **6 Claims**



1. A filter element comprising a filter core, a sleeve around the core, a profiled spacer wrap around the sleeve, and tipping material around the spacer wrap, the profiled spacer wrap providing between the sleeve and tipping material passages which are in lateral air flow communication and extend longitudinally of the filter to open at an end thereof, the tipping material providing in use of the filter for the drawing of external air therethrough directly into at least some of the said passages, and the sleeve at least beneath the passages being smoke-impermeable, wherein the spacer wrap is longitudinally corrugated to provide such longitudinal passages between itself and the tipping material and second such longitudinal passages between itself and the sleeve, the tipping material providing for the drawing of external air therethrough directly into first passages, and adjacent first and second passages being in air flow communication by virtue of the air permeability of the material of the spacer wrap and/or via apertures through the side walls of the corrugations.

4,480,650

COATED SELF-EXTINGUISHED CIGARETTE

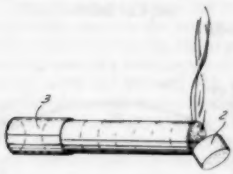
Friedrich Weinert, 219-19-131st Ave., Jamaica, N.Y. 11413

Filed Mar. 2, 1982, Ser. No. 353,963

Int. Cl.³ A24D *1/02, 1/04*

U.S. Cl. 131—349 **1 Claim**

1. A cigarette comprising a charge of tobacco wrapped in a cigarette paper wherein the wrapper is coated on its inner portion that contacts said tobacco with a fire proofing clay in an effective amount so that upon the burning of the cigarette the clay becomes brittle and cracks allowing air to penetrate into the combustion zone but physically segregating the combustion zone from its ambient surroundings and wherein said clay coating is divided into annular sections so that when the



cigarette is smoked the separate clay sections will individually fall off.

4,480,651

COIN FEEDING APPARATUS FOR A COIN DISPOSING MACHINE

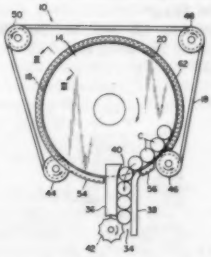
Shiro Nakai, and Takao Baba, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Jul. 8, 1982, Ser. No. 396,216

Claims priority, application Japan, Jul. 16, 1981, 56-111456; Dec. 24, 1981, 56-196850

Int. Cl.³ G07D *3/00*

U.S. Cl. 133—3 A **5 Claims**



1. In a coin disposing apparatus for counting, sorting and/or otherwise processing coins received from a coin supplying means, a mechanism for aligning the coins to be processed comprising:

(a) a rotary disc for receiving from a coin supplying means coins for processing, the disc being adapted to rotate at a speed sufficient to centrifugally send the coins toward the disc periphery;

(b) a coin runway extending substantially radially away from the rotary disc periphery, toward a subsequent processing station, said coin runway being in substantially coplanar relationship with the coin bearing surface of the disc, for delivering the coins from the rotary disc to the coin processing station in a row, the coin runway having an entrance adjacent the periphery of the rotary disc; and

(c) a rotary wall extending along the periphery of the rotary disc, except at least where the entrance of the coin runway is located, said rotary wall being in the form of an upstanding endless belt running around the periphery of the disc with the side face of the belt in frictional contact with the side face of the periphery of the disc to cause the endless belt and the rotary disc to move together, the upper portion of the belt projecting upwardly beyond the coin bearing surface of the disc to confine the coins on the rotary disc.

4,480,652

SPRING COVERING DEVICE

Charles W. Gooch, P.O. Box 44, Chapmansboro, Tenn. 37035

Filed Feb. 2, 1979, Ser. No. 9,255
Int. Cl.³ B63B *17/02*
U.S. Cl. 135—88 **2 Claims**

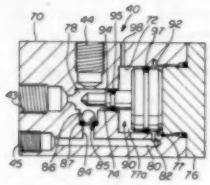
1. A covering mechanism consisting essentially of:
a self-coiling continuous sheet of liquid impermeable material, and having a plurality of integral tapered ribs, and having an upward bow when uncoiled, and having first and second ends;
means for mounting said first end of said sheet for supporting said first end whether said sheet is in a coiled or uncoiled position; and
means for mounting said second end of said sheet for releasably supporting said second end when said sheet is in an uncoiled position, so that said sheet extends generally horizontally with an upward bow.

4,480,653

IN-SERVICE TEST VALVE

Ralph W. Vanderburg, Longview, Tex., assignor to Axelson, Inc., Longview, Tex.

Filed Aug. 12, 1982, Ser. No. 407,336
Int. Cl.³ F17D *3/05*
U.S. Cl. 137—112 **1 Claim**



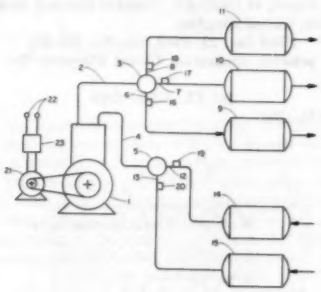
1. A test valve, which comprises:
a valve body including a first bore and an axially spaced apart second bore, said second bore having a diameter larger than that of said first bore;
a shuttle slidingly mounted in said valve body and including a first piston slidingly mounted in said first bore and a second piston slidingly mounted in said second bore, said shuttle being shiftable between an in-service position and test position;
means for forming a sliding seal between said first piston and said first bore to define an effective area;
means for forming a sliding seal between said second piston and said second bore to define an effective area larger than and in the opposite direction to the effective area of said first piston;
means for venting to the atmosphere the space between said sliding seal means;
an in-service inlet formed in said valve body to communicate in-service pressure to said first bore and apply in-service pressure to said first piston effective area;
an in-service valve seat positioned in said first bore adjacent said in-service inlet;
an in-service valve element connected to said first piston and operable by said shuttle to seat on and plug said in-service valve seat when said shuttle is in said test position, said in-service valve element being spaced apart from said in-service valve seat when said shuttle is in said in-service position;
a test inlet formed in said valve body including a passageway and a first outlet communicating with said first bore and a second outlet communicating with said second bore to apply test pressure to said second piston effective area;
a check valve positioned in said first outlet and arranged to allow flow from said passageway toward said first bore and to block flow from said first bore toward said passageway;
and a test valve outlet formed in said valve body communicating with said first bore.

4,480,654

MULTIPRESSURE COMPRESSOR

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Filed Aug. 26, 1982, Ser. No. 411,913
Int. Cl.³ G05D *11/00*
U.S. Cl. 137—119 **17 Claims**



1. A multipressure compressor machine comprising:
a compressor comprising a suction pipe and a discharge pipe;
means for driving said compressor;
a discharge selector valve comprising, at least two discharge ports, an inlet port, and means for connecting said inlet port to said discharge ports one discharge port at a time;
a connection between said compressor discharge pipe and said discharge selector valve inlet;
drive means for driving said discharge selector valve connecting means through a discharge sequence of connectings between said inlet and said discharge ports so that only one discharge port is connected at any one time, each discharge port is connected at least once during each such discharge sequence of connectings;
means for sensing the pressure of each of said discharge ports and for comparing said sensed pressure against a set value of maximum pressure for that discharge port;
control means responsive to said discharge pressure sensing means at the connected discharge port and operative upon said discharge selector valve drive means so that, whenever said sensed discharge port pressure exceeds said set value of maximum pressure for that connected port, said discharge selector valve drive means is actuated to drive said discharge selector valve on to connect to the next discharge port in said discharge sequence, said discharge sequence of connectings is continuously repeated whenever the machine is running;
a suction selector valve comprising, at least two suction ports, an inlet port, and means for connecting said inlet port to said suction ports, one suction port at a time;
a connection between said compressor suction pipe and said suction selector valve inlet;
drive means for driving said suction selector valve connecting means through a suction sequence of connectings

between said inlet and said suction ports so that, only one suction port is connected at any one time, each suction port is connected at least once during each such discharge sequence of connectings;

means for sensing the pressure at each said suction ports and for comparing said sensed pressure against a set value of minimum pressure for that suction port;

control means reponsive to said suction pressure sensing means at the connected suction port and operative upon said suction selector valve drive means so that, whenever said sensed suction port pressure is less than said set value of minimum pressure of that connected port, said suction selector valve drive means is actuated to drive said suction selector valve on to connect to the next suction port in said suction sequence, said suction sequence of connectings is continuously repeated whenever the machine is running.

4,480,655

LIQUID-PLUG-CREATING DEVICE

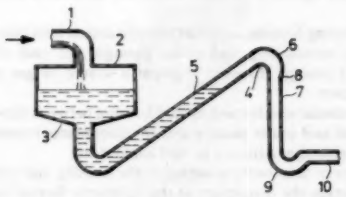
Lars Teglund, Gustavsberg; Pentti Kosonen, Saltsjö-Boo, and Melchiorre Oldani, Gustavsberg, all of Sweden, assignors to Aktienbolaget Gustavsberg, Gustavsberg, Sweden

Continuation-in-part of Ser. No. 093,988, Nov. 14, 1979,. This application Oct. 13, 1981, Ser. No. 310,875

Claims priority, application Sweden, Nov. 22, 1978, 7812055

Int. Cl.³ F04B *10/00*

U.S. Cl. 137—132 **1 Claim**



1. Liquid-plug-creating device for creating both a small, continuous flow of liquid and a large, intermittent flow of liquid in plug-like form with large kinetic energy content in pipes, comprising a collection tank for water, sewage or the like, said tank having a bottom and a closed top spaced upwardly from said bottom, an outlet from said bottom of said tank positioned so that all of the contents of said tank can flow out of said outlet, an inlet into the closed top of said tank, an outlet pipe having a dependent section connected to said tank outlet and extending downwardly therefrom, said outlet pipe including a bent portion connected to the lower end of said dependent section and said bent portion bent in a vertical plane, a riser having an inlet end and an outlet end with the inlet end connected to said bent portion and with said riser extending angularly upwardly from said bent portion of said outlet pipe, a pipe bend bent in a vertical plane is connected to the outlet end of said riser for reversing the upward flow through said riser to a downward flow, a generally vertically extending pipe extending downwardly from said pipe bend, said vertically extending pipe having a reducer at the end thereof connected to the said pipe bend so that a reduction in the flow cross-section takes place from said riser into said vertically extending pipe, the invert of said pipe bend forms an overflow level for flow into said generally vertically extending pipe, and is located not lower than the inlet into the closed top of said tank, a piece of pipe connected to the lower end of said vertical pipe and comprising a partially U-shaped section having an inlet end connected to the lower end of said generally vertically extending pipe and a horizontally extending outlet end, and a generally horizontally extending section connected to said outlet end, said piece of pipe forming a direct passageway from the lower end of said vertically extending pipe into said generally horizontally extending section so that all of the flow downwardly through said vertically extending pipe passes directly into said generally horizontally extending section, the invert at the horizontally extending outlet end of said partially U-shaped section is located above the lowermost point within said piece of pipe and below the crown of said piece of pipe diametrically opposite the lowermost point, an inlet pipe connected to the inlet into the top of said tank and said inlet pipe extending upwardly from the top of said tank for flowing water, sewage or the like into said tank, a connection pipe having a first end connected to the upper part of said outlet section adjacent to said partially U-shaped section and a second end connected to said inlet pipe at a position adjacent to and spaced upwardly from said inlet into the top of said tank so that said connection pipe affords a venting action in said inlet pipe and in a sewer line connected to said outlet section, and said piece of pipe has said partially U-shaped section so that in the small continuous flow in said device with said tank filled to a level approximately even with the overflow level of said pipe bend the small flow entering said tank corresponds to an equally small flow which drops downwardly through said vertical pipe into said partially U-shaped section of said piece of pipe with the small flow passing out through said outlet section from said piece of pipe without completely closing the flow path through said piece of pipe at its lowermost point whereby said piece of pipe acts during such small flow as a non-sealing water trap and only acts as a sealing water trap when the incoming flow increases sufficiently to form a closure of the lowermost point of said piece of pipe whereby a plug of water forms in said piece of pipe and creates the intermittent flow of liquid in plug-like form with large kinetic energy content effecting a suction action for completely removing the contents of said tank, said partially U-shaped section comprises a bight portion including the lowermost point of said piece of said pipe, a first leg connecting said bight portion to the lower end of said generally vertically extending pipe, a second leg connecting said bight portion to said outlet section, and said second leg having a height above the invert of said bight portion less than the height of said first leg above the invert of said bight portion.

4,480,656

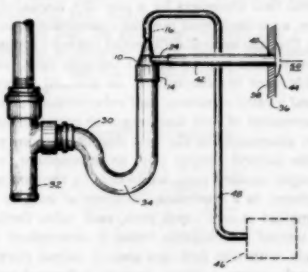
PLUMBING FIXTURE

Robert L. Johnson, 655 S. Dakota St., Seattle, Wash. 98108

Continuation-in-part of Ser. No. 798,836, May 20, 1977,. This application Feb. 21, 1979, Ser. No. 13,147

Int. Cl.³ F16K *24/00*

U.S. Cl. 137—215 **4 Claims**



1. A plumbing system comprising a unitary plumbing fixture and plumbing apparatus:

a. said unitary plumbing fixture comprising a housing:

b. a large outflow end;

c. a small inlet end;

d. said housing defining a tapering body between said large outflow end and said small inlet end;

e. said housing defining a through passageway from said

small inlet end, through said tapering body and to said large outflow end;

f. an overflow tube having a passageway connecting with said housing and with said through passageway;

g. said plumbing apparatus comprising a drain line connecting with said large outflow end;

h. a discharge line connecting with said small end and with an apparatus for discharging a liquid to said small inlet end:

i. an overflow line connecting with said overflow tube and with a source of liquid;

j. said unitary plumbing fixture lessening the possibility of a liquid from said source of liquid flowing to said apparatus for discharging a liquid to said small inlet end;

k. a baffle in said through passageway and juxtapositioned to the inner end of the passageway in said overflow tube to disrupt the flow of liquid from said overflow tube into said through passageway and to direct said liquid toward said large outflow end and away from said small inlet end; and,

l. said baffle being a tube.

4,480,657

VACUUM LINE CONTROL VALVES

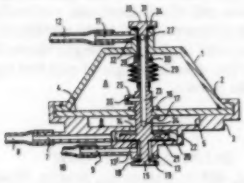
Barry R. Marshall, Minster Lovell, and Paul A. Knight, Abingdon, both of England, assignors to Ambic Equipment Limited, Minster Lovell, England

Filed Oct. 15, 1981, Ser. No. 311,866

Claims priority, application United Kingdom, Nov. 5, 1980, 8035575; Jan. 2, 1981, 8100085

Int. Cl.³ F16K *31/126*

U.S. Cl. 137—103 **7 Claims**



1. A vacuum line control valve operable from a single vacuum input line, to provide vacuum output alternately in a pair of differential output vacuum lines, comprising a hollow body divided into two chambers by a laterally displaceable elastic diaphragm, a vacuum input port for connection to said vacuum input line, first and second differential output vacuum ports for connection to said pair of output vacuum lines, at least one controllable vent to atmosphere, an internal communicating channel and a valve structure, said valve structure being operable by movement of said diaphragm to connect said vacuum input port alternately to the first output vacuum port, while venting the second output port to atmosphere, and to the second output vacuum port, while venting the first output port to atmosphere, in a continuous manner so long as a vacuum input is applied at said input port, said valve further having first and second controllable vents to atmosphere associated respectively with said first and second output ports, wherein said internal communicating channel is formed internally of said valve structure and wherein said valve structure is operable by movement of said diaphragm for connecting said vacuum input port to the first output vacuum port while venting the second output port to atmosphere at said second controllable vent and for connecting said vacuum input port alternately to the second output vacuum port while venting the first output port to atmosphere at said first controllable vent, said connection of the vacuum input port to one of the said output ports being made by way of the said internal communicating channel.

4,480,658

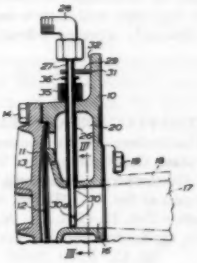
ASPIRATOR SYSTEM FOR SOUND EMITTERS

Charles E. Blakeslee, Santa Ana, Calif., and Ingemar Alsenfelt, Malmö, Sweden, assignors to Kockumation AB, Sweden

Continuation of Ser. No. 172,221, Jul. 25, 1980, abandoned. This application Sep. 16, 1982, Ser. No. 418,603

Int. Cl.³ F16K *43/00*

U.S. Cl. 137—315 **11 Claims**



4. A fluid operated pressure oscillation generator comprising:

(a) a housing forming an outlet passage and an inlet compartment surrounding said outlet passage, one end of said outlet passage disposed adjacent a source of gas under pressure;

(b) an annular seat formed by said housing between the other end of said outlet passage and the inlet compartment;

(c) a diaphragm adjacent to said annular set;

(d) a cover detachably mounted to the housing and adapted to engage the diaphragm at the periphery thereof to bias the diaphragm against the seat, said diaphragm forming a valve controlling a fluid connection between the inlet compartment and the outlet passage;

(e) means for preventing the flow of gases under pressure from said outlet passage to the surroundings when said cover is detached from said housing.

4,480,659

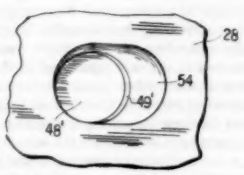
GATE STOP VALVE

Roy N. Peacock, Lafayette, Colo., assignor to HPS Corporation, Boulder, Colo.

Continuation-in-part of Ser. No. 318,459, Nov. 5, 1981, Pat. No. 4,408,634. This application Jun. 27, 1983, Ser. No. 508,003

Int. Cl.³ F16K *3/02*

U.S. Cl. 137—630.12 **11 Claims**



1. A gate valve comprising:

(a) a casing having an inlet aperture and an outlet aperture at least one of which has a valve seat,

(b) an actuator member reciprocal in said casing transversely

of said apertures and having two oppositely disposed faces,

(c) means for imparting reciprocation to said actuator member,

(d) two plate members flanking said two oppositely disposed faces of said actuator member, at least one of said plate members being a valve head for cooperation with said valve seat, and

(e) cylindrical rotative means having a rectangular cross-section, said rotative means positioned between said actuator member and said two plate members for moving said two plate members from an open to a closed and latched position as said actuator member is reciprocated.

4,480,660

SAFETY VALVE

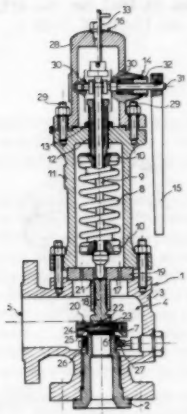
Martin Bayart, Villeneuve D'Ascq; Bernard Grincourt, Lille, and René Chabierski, Annoeullin, all of France, assignors to S.A. Etablissements SARASIN et Cie, Haubourdin, France

Filed Jul. 22, 1982, Ser. No. 400,961

Claims priority, application France, Apr. 7, 1982, 82 06372

Int. Cl.³ F16K *17/30*

U.S. Cl. 137—478 **1 Claim**



1. A safety valve for limiting the pressure of a fluid contained in a vessel comprising:

a hollow body defining an escape chamber and having first and second openings opposite one another and a third opening at one side between said first and second openings and constituting a fluid discharge opening,

a nozzle secured in said first opening of said body and adapted to be connected with said vessel, said nozzle having an inner end portion extending into said escape chamber and terminating in a valve seat,

a valve guide in said second opening and comprising a disc portion clamped between said body and an inner end of an elongate first casing secured to said body and a central tubular portion directed toward and aligned with said nozzle,

a valve support comprising a stem portion slidably received in said tubular portion of said valve guide and a cup-shaped head portion at the inner end of said stem portion and facing said nozzle,

a flap valve tiltably retained in said head portion of said valve support and adapted to seat on said valve seat at the inner end of said nozzle,

a compression spring in said first casing surrounding a shaft aligned with said stem portion of said valve support and having a lower end engaging said stem portion and an upper end extending out through a threaded central opening in an outer end wall of said first casing,

said spring being compressed between a first cup bearing on a shoulder spaced from the lower end of said shaft and a second cup bearing on an inner end of said tension-adjusting sleeve, said sleeve being rotatable to adjust the tension of said spring,

a second casing removably secured on the outer end of said first casing and having a bore into which an upper end portion of said shaft extends,

a rotatable spindle extending transversely of said second casing and having a projecting end portion extending out through a wall of said second casing, handle means on said projecting end portion of said transverse spindle for manually rotating said spindle, and cam means on said transverse spindle engageable with abutment means on said shaft to lift said shaft upon rotation of said transverse spindle to open said valve,

the upper end of said stem portion of said valve support teminating below the upper end of said tubular portion of said valve guide and said shaft having a lower end portion extending into said tubular portion of said valve guide and having a rounded lower end engaging the upper end of said stem portion of said valve support, said lower end portion of said shaft being of smaller cross section then said stem portion, whereby fluid pressure in said first casing is applied to the upper end of said stem portion of said valve support in said tubular portion of said valve guide, said disc portion of said valve guide having at least one small calibrated hole therethrough to permit attenuated flow of fluid from said escape chamber to the interior of said first casing, whereby an increase of pressure in said escape chamber upon the opening of said valve upon occurence of excess pressure in said vessel will be transmitted to the interior of said first casing with a delay and will be applied to the upper end of said stem portion of said valve support in said tubular portion of said valve guide to supplement the force of said spring to close said valve upon a predetermined drop of pressure in said vessel a screw threaded rod extending through a tapped hole in the outer end of said second casing and engageable with said shaft to lock said valve in the closed position when said rod is screwed in, and means for sealing the entrance of said rotatable spindle into said second casing, whereby said second casing is closed.

4,480,661

AIR FLOW CONTROL VALVE MEANS

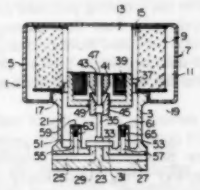
Yukio Kawai; Michio Morishita, both of Toyota; Hiromi Otsuki, Anjo, and Takashi Kondo, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 25, 1982, Ser. No. 392,369

Claims priority, application Japan, Jul. 2, 1981, 56-98640[U]

Int. Cl.³ F16K *37/00*

U.S. Cl. 137—544 **1 Claim**



1. An air flow control valve means disposed in an air bleed passage comprising:

a valve housing, said valve housing having a tubular chamber extending from an axial end wall to a position upstream of air flowing through said valve housing;

an air flow passage having one end extending through said

axial end wall into said chamber and another end extending outside said valve housing;

valve means for controlling air flowing through said air flow passage;

means for actuating said valve means to open and shut said flow passage; and

a bypass air passage having one end extending through said axial end wall into said chamber and another end communicating with said air flow passage, air flowing continuously between said air flow passage and said chamber, said bypass air passage end extending into said chamber from said axial end wall further than said air flow passage end;

a jet element disposed in said bypass air passage to reduce the effective cross-sectional area of said bypass air passage; and

an air filter element disposed across and contiguous with said bypass air passage upstream from said jet element.

4,480,662

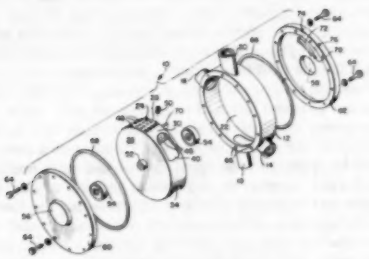
HYDRAULIC SYSTEM VALVE

Wilbur D. Garrels, 4421 Ward St., Wichita Falls, Tex. 76310

Continuation-in-part of Ser. No. 368,003, Apr. 13, 1982, abandoned. This application May 27, 1982, Ser. No. 382,607

Int. Cl.³ F16K *11/085*

U.S. Cl. 137—625.23 **13 Claims**



1. A fluid pressure equalizing valve adapted for use in hydraulic systems comprising:

a valve body having a fluid inlet port, a fluid discharge working port and at least one fluid discharge vent port therein;

a valve plug comprising a plug body having a peripheral wall, said plug disposed in said valve body and having a working flow passageway and at least one vent flow passageway formed therein and communicating with said peripheral wall, said plug being movable with respect to said valve body between a first fluid working position wherein said working flow passageway is aligned with said fluid inlet and said fluid discharge working ports to provide fluid flow communication therebetween for passing inlet fluid to the working port and a second fluid vent position wherein said vent flow passageway is aligned with at least one inlet and fluid discharge working ports and said fluid discharge vent port to provide fluid flow communication therebetween for passing inlet fluid to a vent port;

said valve plug including a plurality of orifice passageways formed therein communicating said peripheral wall with said vent flow passageway, the diameter of each said orifice passageway being substantially smaller than the diameter of said working flow passageway, means preventing fluid flow through said orifice passageways when said valve plug is in its first and second positions, at least one of said orifice passageways communicating at least one of said inlet and discharge working ports and said vent port via said vent flow passageway as said valve plug moves between its first and second positions, said orifice passageways being arranged such that said valve plug is movable from its first position to its second position, and vice versa, to selectively subtract or add, respectively, the number of orifice passageways communicating said inlet and working ports with said vent port via said vent flow passageway;

plug means for selectively closing any of said orifice passageways, said plug means being removably insertable in said orifice passageways; and

means for moving said valve plug between is first and second positions.

4,480,663

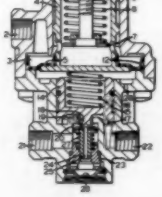
PNEUMATIC RELAY VALVE

Klaus-Dieter Bergemann, Hanover; Karl-Heinz Deike, Pattensen; Bernd-Joachim Kiel, Wunstorf, and Heinz-Werner Konig, Barsinghausen, all of Fed. Rep. of Germany, assignors to Wabco Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,300

Int. Cl.³ B60T *15/22*

U.S. Cl. 137—627.5 **10 Claims**



1. A relay valve for regulating an output pressure in accordance with a control pressure comprising:

(a) a valve housing having at least one inlet port connectable to a source of supply pressure, at least one outlet port connectable to a receiver, and at least one control inlet connected to a source of control pressure, and having first and second control chambers,

(b) a first relay piston member located in said first control chamber and having a first effective surface acted upon by said control pressure, a second relay piston member located in said second control chamber and having a second effective surface acted upon by said supply pressure,

(c) supply pressure inlet chamber connected with said supply pressure inlet port,

(d) said supply pressure inlet chamber connectable with said second control chamber by a multi-way valve having an initially opened inlet valve,

(e) said second control chamber connectable with atmosphere by said multi-way valve which has an initially closed exhaust valve,

(f) a compression spring disposed between said first and second relay piston members for ensuring that a predetermined pressure level is available at the outlet port, and

(g) said second relay piston member operatively connected to said multi-way valve for closing said inlet valve when the pressure in said second control chamber reaches said predetermined pressure level.

4,480,664

ELECTROMAGNETICALLY CONTROLLABLE COUPLING MEANS FOR THE DRIVE SHAFT OF A TEXTILE MACHINE

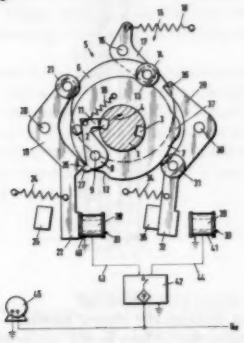
Hans-Jürgen Höhne, Hainburg, and Kresimir Mista, Heusenstamm, both of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,652

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222581

Int. Cl.³ D03C *1/00*

U.S. Cl. 139—76 9 Claims



1. Electromagnetically controllable coupling means linking the drive shaft of a textile machine by a camming action for controlling rotation dependent motion of said machine comprising

a pair of diametrically positioned longitudinal grooves in the circumferential surface of the drive shaft,

cam means rotatable about said drive shaft,

spring biased latch means rotatably mounted on said cam means, and having two opposing ends, said latch means having a nose for engaging one of said grooves at one end thereof, the other end thereof having a striker edge,

a first and a second rocker arm rotatably mounted on fixed axes on opposing sides of said cam means, each of said rocker arms having a striker for engaging the striker edge of said latch means;

a first and second magnetically attractable anchor means attached to one end of said first and second rocker arms, respectively;

a first and second spring means attached to said rocker arm for biasing said first and second anchor means,

a first and second programmable electromagnet disposed proximate to said first and second anchor means, respectively, each of said electromagnets having sufficient attractive force to hold its respective one of said anchor in contact therewith against the bias of said spring means, said cam means being operable to successively engage each of said rocker arms to move its anchor proximate to a corresponding one of said electromagnets,

means for holding said cam means in one of two predetermined positions;

long acting magnetic field means for continuously providing an electromagnetic force to each of said electromagnets,

electromagnetic field neutralizing coil provided to said electromagnets for neutralizing the magnetic flux of said long acting magnetic field means,

whereby upon activation of the neutralizing coil the anchor means are no longer held in contact with the electromagnets and the striker of one of said rocker arms is biased out of contact with said striker edge of said latch means whereby the nose of said latch is biased into engagement with one of said grooves in said shaft whereby said cam means is rotatable with said shaft.

4,480,665

WEFT-BAR (SET MARK) PREVENTION SYSTEM FOR A LOOM

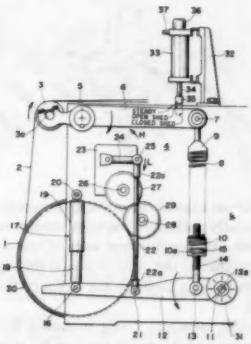
Shuichiro Imamura, and Akira Arakawa, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 29, 1982, Ser. No. 428,666

Claims priority, application Japan, Jan. 21, 1981, 57-6754; Nov. 27, 1981, 56-189083

Int. Cl.³ D03D *49/14*

U.S. Cl. 139—97 10 Claims



1. A weft-bar prevention system for a loom in which warp threads let-off from warp beams are guided to a cloth fell under an appropriate warp tension by the aid of an elastically supported guide member, which comprises:

(a) loom-starting angle detection means for detecting at least two angular ranges of a drive shaft of the loom when the loom is started and outputting angular range signals corresponding thereto;

(b) warp-tension selection means for selecting a warp tension signal in accordance with each of the angular range signals outputted from said loom-starting angle detection means and outputting a warp tension signal corresponding thereto;

(c) initial-cycle determination means for determining at least one initial cycle during which warp tension is additionally applied after the loom has been started and outputting a timing signal only during the at least one initial cycle determined thereby;

(d) actuator-driving means for outputting at least one actuator driving signal in response to the warp tension signal from said warp-tension selection means only while said initial-cycle determination means is outputting a timing signal thereto; and

(e) warp-tension increasing means for increasing tension to be applied to the warp threads in response to at least one actuator driving signal outputted from said actuator-driving means,

whereby additional tensions are applied to the warp threads according to the angular ranges of the loom for at least one initial cycle after the loom has been started.

4,480,666

MATERIAL SPLITTER

Michael D. Milosh, and Robert J. Geoghegan, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Apr. 11, 1983, Ser. No. 484,145

Int. Cl.³ B27L *7/00*

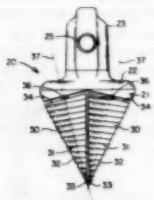
U.S. Cl. 144—194 10 Claims

1. An apparatus for forcibly splitting material including wood comprising:

a. a plurality of conical and threaded wedge members having

a base and a point, said wedge members being mounted on separate longitudinal rotational axes, the wedge members being rotatable about their said longitudinal axes, with said axes passing through the conical point of each said wedge members and through the center of the base of each said wedge member;

b. each wedge member having a conically threaded surface;



c. the rotational axes of the conical members being mounted by essentially inflexible support means relative to each other with said longitudinal axes of the conical members closer together at the conical points than the said longitudinal axes passing through the bases of the conical members; and

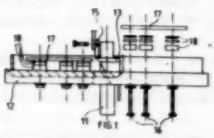
d. the conical members being mounted for rotation on a frame means and driven in rotation by power means connected to the conical wedge members.

4,480,667

APPARATUS AND METHOD FOR REGULATING THE LENGTH OF WOOD CHIPS

Jorma Vaittinen, and Seppo Könönen, both of Joensuu, Finland, assignors to S,A, Tervo Oy Karjalan Rautarakenne, Finland

Filed Dec. 10, 1982, Ser. No. 448,782
Claims priority, application Finland, Dec. 11, 1981, 813997
Int. Cl.³ B27L *11/00*
U.S. Cl. 144—373 **7 Claims**



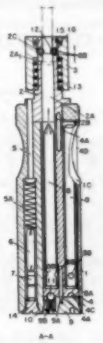
1. A method for regulating the length of chips cut in a wood chipper comprising, rotating a cutter disc about a central axis, mounting a cutting blade on the cutter disc for rotation therewith, positioning a counterblade at a predetermined axial spacing from the cutting blade, axially spacing a stop member from the cutting blade selected predetermined amounts by mounting the stop member on the cutter disc so as to be axially adjustable with respect to a frame of the cutter disc while maintaining the position of the cutting blade and the relative axial spacing between the cutting blade and the counterblade unchanged.

4,480,668

SCREW DRIVER KIT

Ching-Hsiung Lin, No. 47, La. 5, Shang Jen St., Kaohsiung, Taiwan

Filed Dec. 7, 1982, Ser. No. 447,686
Int. Cl.³ B25G *1/08*
U.S. Cl. 145—63 **2 Claims**



1. A screw driver kit comprising:

an elongated cylindrically shaped handle;

a longitudinal magazine bore in said handle having its central axis extending parallel to and offset from the central axis of said handle;

a cylindrical magazine rotatably mounted in said magazine bore;

a hole through said handle communicating with said magazine bore so that a portion of the outer surface of said magazine is accessible through said hole for rotating said magazine;

a plurality of screw driver blade bores extending through said magazine parallel to and circumferentially spaced about the axis of rotation of said magazine;

a screw driver blade in each magazine bore, each having a working end and a holding end;

a cylindrical blade holder mounted on one end of said handle;

a blade receiving bore through said blade holder aligned with one of said blade bores in said magazine when said one of said blade bores is in position for use and having a cross-section large enough to slidingly receive the working end of a blade;

a reduced section in said blade holder bore large enough to slidingly receive the working end of said blade and small enough to prevent the holding end thereof from passing therethrough;

a plurality of radial holes through the wall of said blade holder;

a clamping ball radially movable in each radial hole so that in their radially innermost position said clamping balls penetrate into said reduced section into stopping position to prevent the working end of said blade from passing therethrough and into clamping position to clamp the holding end of a blade in position for use;

a plurality of substantially hemispherical detents circumferentially spaced about the outer periphery of the holding end of each blade so that when in position for use said detents are aligned with said clamping balls to receive them when in said clamping position;

a sleeve shaped clamping head slidably mounted on said blade holder for limited axial movement with respect to said blade holder;

an annular internal shoulder on said clamping head positioned to operatively engage and urge said clamping balls radially inwardly into the clamping and stopping positions;

an annulus in said clamping head surrounding said blade holder between said annular shoulder and the end of said clamping head adjacent the handle;

a shoulder on the outer surface of said blade holder adjacent the handle;

a helical coil spring in said annulus between said shoulder on said blade holder and said annular shoulder on said clamping head to resiliently urge said clamping head away from said handle; and

a retaining ring on said blade holder positioned between the outer working end thereof and said annular shoulder to operatively engage said annular shoulder to nominally retain the clamping head in the clamping and stopping position;

so that said screw driver blades can be selectively positioned for use by rotating said magazine through said hole in the handle and when aligned with said blade receiving bore in said blade holder, a blade can be fed into or returned from operating position by tilting the working end downwardly or upwardly respectively while said clamping head is moved toward said handle.

4,480,669

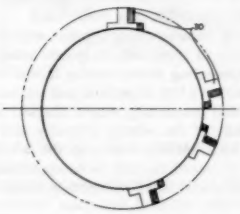
TIRE COOLING STRUCTURE

F. Oren Skidmore, 2513 Third St., Cuyahoga Falls, Ohio 44221

Continuation-in-part of Ser. No. 224,374, Jan. 12, 1981, Pat. No. 4,381,026. This application Feb. 3, 1983, Ser. No. 463,566

Int. Cl.³ B60C *19/06*

U.S. Cl. 152—153 **9 Claims**



1. In combination,

a standard one-piece drop center rim, said rim having a closed substantially flat well and substantially horizontal bead receiving flanges extending laterally from the well and integral therewith,

tire bead retaining flanges extending substantially vertically from the edges of the bead receiving flanges and integral therewith,

a radially inwardly projecting wheel secured to the well of the rim,

a pneumatic tire having a tread and sidewalls mounted in fluid tight relation on the rim and secured by the tire bead retaining flanges, and

a plurality of circumferentially spaced radially directed inverted T-shaped paddles mounted substantially perpendicular to the torus of the rim but across a substantial portion of the width thereof within the fluid tight cavity defined by the tire and the rim and spaced at a distance apart to effectively agitate the fluid providing pressure in the tire during rotational operation thereof in fluid streams directed from the rim towards the tread of the tire to transfer heat generated at the tread to the rim;

wherein said inverted T-shaped paddles are at angles of 15° to 70° with respect to the rotational plane of said drop center rim.

4,480,670

TRACK BELT ASSEMBLY

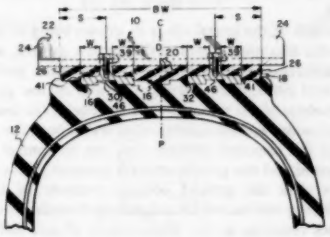
Roger E. Payne, Okemos, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 29, 1980, Ser. No. 221,148

The portion of the term of this patent subsequent to Oct. 6, 1999, has been disclaimed.

Int. Cl.³ B60C *27/06, 9/18;* **B62D** *55/26, 55/28*

U.S. Cl. 152—169 **15 Claims**



1. An endless track belt assembly comprising:

a reinforcing belt structure having a pair of lateral edges;

a plurality of shoes disposed about the outer periphery of said reinforcng belt structure;

characterized by means securing said shoes to said track belt assembly including at least one anchor plate extending in generally parallel superposition with at least one of said shoes;

said belt structure having a plurality of openings, said openings being disposed between the lateral edges of said belt structure, a portion of said belt structure is disposed between said anchor plate and said shoe, said anchor plate having integrally formed therein at least one projecting mating portion which extends through one of said openings in said belt reinforcing structure to mate with said shoe, said projecting mating portion being disposed solely between the lateral edges of said reinforcing belt structure and having at least one fastening means for engagement with said shoe, said at least one shoe having no fastening means disposed axially outward of said lateral edges of said reinforcing belt structure.

4,480,671

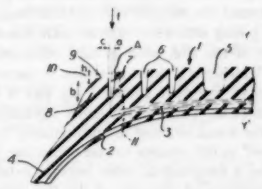
TREAD AND HEAVY DUTY TIRE

Daniel G. Giron, Greer, S.C., assignor to Michelin Recherche et Technique S.A., Basel, Switzerland

Filed Apr. 26, 1982, Ser. No. 371,666

Int. Cl.³ B60C *11/06*

U.S. Cl. 152—209 R **6 Claims**



1. A tread for a non-driving axle tire for transport vehicles, the tire comprising a tread, two sidewalls and two beads, a radial carcass reinforcement and a tread reinforcement formed of at least two plies of wires or cables parallel in each ply and crossed from one ply to the next, characterized by the fact that the tread comprises in each of its two lateral zones a narrow, substantially circular circumferential groove defining a

lateral rib, said narrow groove having a width of between 0.5% and 4% of the width of the tread and said lateral rib having a sloping shoulder,

the meridian profile of the lateral rib being substantially parallel to and inward of the meridian profile of the geometrical envelope of the principal median zone of the tread,

said principal median zone having a sharp, non-rounded edge where it intersects the tread surface, the sharp edge being maintained during the life of the tire by the lateral rib,

the width of the lateral rib at its crown being at most equal to the maximum depth of the narrow groove, and

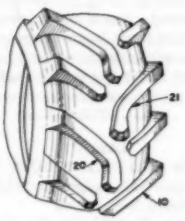
the difference in level between the meridian profile of the lateral rib and the meridian profile of the geometrical envelope of the principal median zone of the tread is such that under normal conditions of travel both the lateral rib and the principal median zone are in contact with the ground and the ground contact pressure of the former is less than the ground contact pressure of the latter, whereby said lateral rib and principal median zone wear at rates resulting in the maintenance of said difference in level during the life of the tire.

4,480,672

ANTIVIBRATION TRACTOR TIRE

Kenneth D. Marshall, Broadview Heights, and Michael A. Berzins, Brecksville, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 11, 1983, Ser. No. 512,842
Int. Cl.³ B60C *11/08*
U.S. Cl. 152—209 B **4 Claims**



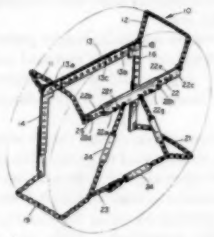
1. A pneumatic tire for tractors and other off-the-road vehicles having a tread comprising a series of y-shaped lug pairs spaced around the periphery of the tire comprising transverse alternating long and short lugs at each side of the peripheral centerline of the tire, each of said transverse lugs having a length at least several times its width, is spaced from the transverse lugs of the next adjacent lug pair a distance at least several times its width and extends inwardly from the outer sides of the tread inclined at substantially the same angle of between 40° to 60° relative to said centerline, each of said long lug having a longitudinal nose portion extending, in the intended direction of rotation of the tire, along and disposed substantially symmetrical with respect to said centerline, each of said nose portions overlapping the trailing end of the next adjacent lug pair to receive the load as it is transferred from said end portions, and being spaced from the nose portion of the next adjacent lug pair to provide an earth-receiving recess therebetween and such that said nose portions of all of said long lugs collectively occupy no more than about half the circumference of the tread along said centerline.

4,480,673

TIRE CHAIN DEVICE

Alan M. Anderson, 701 N. Shore Dr., Hastings, Nebr. 68901

Filed May 26, 1983, Ser. No. 498,458
Int. Cl.³ B60C *27/06*; G09F *7/00*
U.S. Cl. 152—216 **13 Claims**



1. A tire chain device, comprising:

first connecting means connecting an end of each of a first pair of cross links in spaced apart relationship;

two second connecting means connecting an end of each of a second pair of longer cross links to each end of said first connecting means at a point spaced away therefrom and the two second connecting means are adapted for pivoted attachment to said first connecting means, said attachment being limited to place the ends of the first and second connecting means radially outward from the rotational axis of the tire to the extent said ends do not exceed the radial outmost extent of the adjacent sidewall of the tire, said first and two second connecting means adapted for placement on the inside of a wheel; and

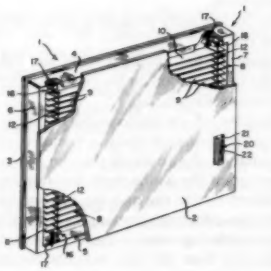
third connecting means connecting the second end of each of the first pair of cross links in spaced apart relationship, said third connecting means having means for removably attaching thereto a link of each of said second pair of cross links, said third connecting means adapted for placement on the outside of the wheel, whereby said first pair of cross links may initially rest atop the wheel while said second pair of cross links may be brought under the wheel and attached to said third connecting means.

4,480,674

MAGNETIC ACTUATING MECHANISM FOR PIVOTAL VENETIAN BLIND ASSEMBLY

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Filed Aug. 2, 1982, Ser. No. 404,468
Int. Cl.³ E06B *3/32*
U.S. Cl. 160—107 **12 Claims**



1. A magnetic actuating mechanism for a pivotal venetian blind assembly having a plurality of adjacent slats including an

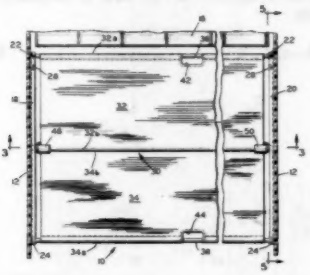
end slat at each end thereof, at least one tape cable forming a part of a supporting means supporting said slats, a hanger pivot member adapted to be pivotally mounted with respect to a frame member positioned adjacent each end slat of said plurality of slats supporting a tape cable therebetween, a linearly movable operating element, connecting means operably connecting said operating element with each hanger pivot member, a linearly movable operatable element and magnet means operatively connecting said operable element with said operating element, characterized in that said operating element comprises a split housing forming two similar housing sections, in that each housing section has a magnet therein and in that said housing is connected betwen said sections to connecting means.

4,480,675

SECURITY COVER FOR AN AUTOMOBILE STORAGE COMPARTMENT

Donald E. Berkemeier, Bloomfield Hills, Mich., assignor to LOF Plastics Inc., Troy, Mich.

Filed Sep. 29, 1982, Ser. No. 426,934
Int. Cl.³ B60R 5/04; F06B 9/08
U.S. Cl. 160—121 C **3 Claims**



1. A security cover for use in covering a storage compartment comprising:

a pair of longitudinally extending track members disposed along opposite sides and between opposite ends of the compartment to be covered, each of said track members including hooked end portions and a longitudinally-extending recess extending therebetween;

an elongate roller member extending between said track members;

means associated with each end of said roller member for effecting a sliding engagement throughout the length of the recess of each said track member, said means including an end cap having an outwardly extending tongue portion, said tongue portions being received in the recesses of said track member for sliding engagement therewith;

flexible sheet material of a size to cover the compartments;

means for connecting said roller member to said sheet material intemediate opposite ends thereof;

means for selectively maintaining the opposite ends of said sheet material near respective opposite ends of the compartment to cover the compartment, said means comprising an end rod attached to each opposite end of said sheet material, the end portions of said end rods being selectively receivable in the respective hooked end portions of said support members;

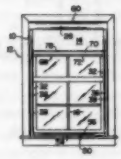
and means for urging rotation of said roller member to effect a rolling of said sheets concentrically about said roller member and sliding movement along said track members when said end rod of one of the opposite ends of said sheet material is released from the respective hooked end portions of said track members, whereby said sheet material is wound about said roller to uncover the storage compartment when either opposite ends of said sheet material is released.

4,480,676

INSULATION ASSEMBLY

Victor J. Solomon, 1638 Doris Dr., Sarasota, Fla. 33580

Filed Sep. 15, 1983, Ser. No. 532,495
Int. Cl.³ E06B 9/17
U.S. Cl. 160—272 **6 Claims**



1. An insulation assembly comprising a retractable flexible panel means mounted on a roller element affixed within a conventional portal frame structure including a closure such as a window or door, said retractable flexible panel means including a flexible panel member having a panel gripping means affixed to the lower portion thereof and a side track means disposed on opposite sides of said flexible panel member, each said side trackmeans comprising a first and second side track member disposed in substantially parallel spaced relationship relative to each other and to said flexible panel member, the outer portion of said first and second side member being curved inwardly toward each other to cooperatively form an arcuate shape having a slot formed therebetween to form a cavity to receive respective opposite ends of said flexible panel member, said first and second track members each including a sealing element within said cavity inclined inwardly away from said slot, each said sealing element extending beyond the centerline between said first and said second track members to engage opposite surfaces of said flexible panel member disposed within said cavity such that said flexible panel member forms a curvilinear configuration within said cavity to substantially seal respective opposite sides of said flexible panel member.

4,480,677

METHOD FOR PROCESSING AND FABRICATING METALS IN SPACE

H. Keith Henson, 1010 E. Speedway, Tucson, Ariz. 85719, and K. Eric Drexler, 518 Putnam Ave., #9, Cambridge, Mass. 02139

Continuation-in-part of Ser. No. 737,577, Nov. 1, 1976, abandoned. This application Jun. 17, 1980, Ser. No. 160,224
Int. Cl.³ B22D 19/04, 23/00
U.S. Cl. 164—46 **5 Claims**

1. A method for forming a complex object from a plurality of substrates having a layer of vaporized materials depositing thereon interconnecting the substrates comprising the steps

a. surrounding the plurality of substrates with a second material;

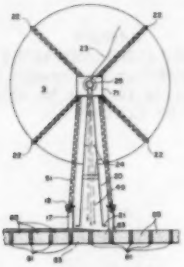
b. removing of a portion of the second material away from the plurality of substrates to expose a part of each of the substrates;

c. heating the materials to vaporize;

d. depositing the vaporized materials upon the exposed

portion of each of the substrates and upon a part of the second material;

e. removing the second material; and



f. exposing the complex object formed of the vaporized material and plurality of substrates.

4,480,678

APPARATUS FOR CONTROLLING AND GUIDING OSCILLATIONS OF A CONTINUOUS CASTING MOLD

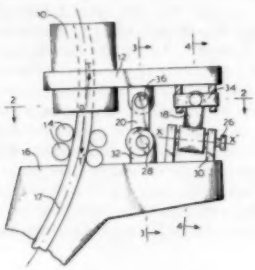
Joel Cazaux, Chelles, and Joseph Pietryka, Versailles, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Aug. 5, 1982, Ser. No. 405,388

Claims priority, application France, Aug. 10, 1981, 81 15430; Apr. 20, 1982, 82 06730

Int. Cl.³ B22D *11/04, 27/08*

U.S. Cl. 164—416 13 Claims



1. In a continuous casting machine comprising a mold having a mold cavity and a discharge outlet, and a guide rack arranged in alignment with said mold cavity for guiding a continuous casting from the discharge outlet of the mold, the mold cavity and the guide rack together defining a casting path an apparatus for controlling and guiding oscillations of the mold, comprising

(a) a fixed support,

(b) a first connecting rod pivotally connected to the mold at one end thereof,

(c) a first cam shaft carried by the fixed support, the first cam shaft having an axis extending perpendicularly to the axis of the casting path or to the direction of a tangent on said axis at a point adjacent the mold outlet and parallel to a vertical plane containing said casting path axis, an end of the first connecting rod opposite to the one end being mounted on the first cam shaft,

(d) a second connecting rod pivotally connected to the mold at an end thereof, and

(e) a second cam shaft carried by the fixed support, the second cam shaft having a horizontal axis extending perpendicularly to the axis of the first cam shaft, an end of the second connecting rod opposite to the one end being mounted on the second cam shaft, the mounting of each connecting rod on a respective one of the cam shafts being arranged to prevent any movement of the connecting rod with respect to the fixed support and to the mold in a direction parallel to the axis of the respective can shaft.

4,480,679

CHILL MOLD FOR MULTIPLE CONTINUOUS CASTING OF WIRES AND CASTING STRANDS WITH SMALL CROSS-SECTIONS FROM METAL

Ulrich Katschinski, Essen, Fed. Rep. of Germany, assignor to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany

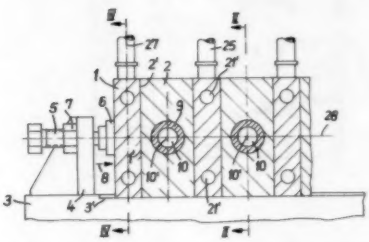
PCT No. PCT/DE81/00074, § 371 Date Aug. 28, 1981, § 102(e) Date Aug. 28, 1981, PCT Pub. No. WO82/03998, PCT Pub. Date Nov. 25, 1982

PCT Filed May 21, 1981, Ser. No. 299,028

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948490

Int. Cl.³ B22D *11/00*

U.S. Cl. 164—420 8 Claims



1. A chill mold for the continuous casting of a multiplicity of metal strands comprising:

a plurality of geometrically similar casting bodies of thermally conductive material each formed with a respective continuous-casting cavity for the production of a respective strand;

a plurality of geometrically similar cooling bodies of thermal conductive material each formed with at least one cooling passage;

clamping means for securing said bodies in a stack with each casting body flanked by and pressed between two of said cooling bodies and said cooling bodies alternating with said casting bodies along said stack and said cavities opening at opposite sides of the stack;

means at one of said sides of said stack for feeding molten metal to said cavities whereby said strands emerge from said cavities at the other side of said stack; and

means for connecting said cooling passages in a coolant circulation path, said clamping means for securing said bodies in a stack including a table plate forming a support surface, all of said bodies resting against said support surface, said support surface being provided with a pair of stops at opposite ends of said stack and bearing against the cooling bodies at said opposite ends, at least one of said stops being adjustable in a direction toward the other of said stops, and

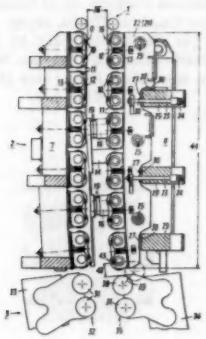
a respective adjustable clamping member bearing against each of said casting bodies and individually urging same towards said one of said sides.

4,480,680

BOW-TYPE CONTINUOUS CASTING PLANT FOR STRANDS

Werner Scheurecker, Linz, and Walter Antonitsch, Kematen, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Continuation of Ser. No. 182,763, Aug. 29, 1980, abandoned. This application Aug. 5, 1983, Ser. No. 520,749
Claims priority, application Austria, Oct. 1, 1979, 6396/79
Int. Cl.³ B22D *11/12*
U.S. Cl. 164—442 9 Claims



1. In a bow-type continuous casting plant for strands of the type including a mould, a bending arrangement for the strand arranged below said mould, and a circular-arc guide for the strand following said bending arrangement, said circular-arc guide having a first roller way and a second roller way arranged opposite each other for accomodating supporting rollers, the spacing between said first and second roller ways of said circular-arc guide being variable in accordance with the strand cross-section by parallel displacement of at least one of said roller ways along a radius of curvature of said arc, said bending arrangement being comprised of oppositely disposed bow-structure parts supported on each other, each of said bow-structure parts carrying a set of bending and supporting rollers, the sets of bending and supporting rollers defining a path for said strand leading into said circular-arc guide rollerways, the improvement wherein

one of said bow-structure parts with its respective set of bending and supporting rollers is fixed on a supporting structure and the other of said bow-structure parts is displaceable toward and away from said fixed bow-structure part, and wherein

a plurality of interchangeable roller carriers for the rollers is provided for said displaceable bow-structure part, each of said roller carriers carrying a set of bending and supporting rollers and being of a different predetermined length, in the direction of said strand, corresponding to a different strand cross-section format and spacing of the roller ways of said circular-arc guide.

one of said roller carriers with its set of bending and supporting rollers being detachably fastened to the displaceable bow-structure part at a time.

4,480,681

REFRACTORY MOULD BODY AND METHOD OF CASTING USING THE MOULD BODY

Kevin Alexander, Stoke-on-Trent, and Howard J. Farr, Stafford, both of England, assignors to Doulton Industrial Products Limited, Stone, England

Filed Aug. 30, 1982, Ser. No. 412,491
Int. Cl.³ B22C *1/00*; B22D *29/00*
U.S. Cl. 164—522 2 Claims

1. A refractory body consisting essentially of a water-soluble salt having the following particle size distribution:

100% by weight of the particles have a size less than 750 μm;
90% by weight of the particles have a size of 8–600 μm;
80% by weight of the particles have a size of 5.5–500 μm;
70% by weight of the particles have a size of 4–400 μm;
60% by weight of the particles have a size of 2.8–350 μm;
50% by weight of the particles have a size of 2.0–280 μm;
40% by weight of the particles have a size of 1.6–220 μm;
30% by weight of the particles have a size of 1.0–180 μm;
20% by weight of the particles have a size of 0.3–160 μm;
10% by weight of the particles have a size of 0.1–125 μm.

2. A method of producing a casting of a castable metal or alloy, comprising forming a mold assembly including a foundry mold part constituted by a composition which consists essentially of a water-soluble salt having the following particle size distribution:

100% by weight of the particles have a size less than 750 μm;
90% by weight of the particles have a size of 8–600 μm;
80% by weight of the particles have a size of 5.5–500 μm;
70% by weight of the particles have a size of 4–400 μm;
60% by weight of the particles have a size of 2.8–350 μm;
50% by weight of the particles have a size of 2.0–280 μm;
40% by weight of the particles have a size of 1.6–220 μm;
30% by weight of the particles have a size of 1.0–180 μm;
20% by weight of the particles have a size of 0.3–160 μm;
10% by weight of the particles have a size of 0.1–125 μm;

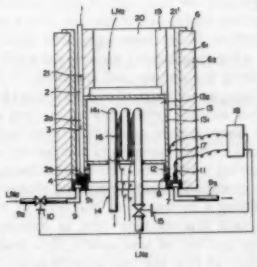
introducing into the mold assembly a charge of the castable metal or alloy in molten form, allowing the charge to solidify, and removing the foundry mold part from the casting so formed.

4,480,682

APPARATUS FOR FREEZING FERTILIZED OVA, SPERMATOZOA OR THE LIKE

Hiroshi Kaneta; Nobuo Sakao, and Yasuo Kuraoka, all of Sapporo, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Filed Jan. 9, 1984, Ser. No. 569,381
Claims priority, application Japan, Jan. 14, 1983, 58-4738
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—14 7 Claims



1. An apparatus for freezing fertilized ova, spermatozoa or the like comprising:

a heat transfer bottom board block formed at the lower end of a heat insulating peripheral wall with a lower refrigerant passage capable of flowing refrigerant,

a bottom board temperature sensor attached to said bottom

board block for detecting the temperature of said bottom board block,

an upper heat transfer block placed on said bottom board block through a heat insulating joint member, formed with an upper refrigerant passage for flowing the refrigerant,

a temperature control heater,

an upper block temperature sensor, and

a plurality of erecting tube charging spaces of tubes opened at the top thereof with the bottom board block as a bottom member between said peripheral wall and said upper block in such a manner that the tubes respectively erected and charged into the spaces are cooled at the lower ends thereof by said bottom board block and at the upper part containing articles to be frozen such as fertilized ova, spermatozoa or the like contained in buffer solution in said tubes.

4,480,683

ARRANGEMENT FOR HEAT AND MASS TRANSFER BY MEANS OF HOLLOW FIBERS

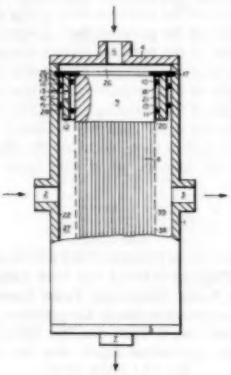
Rudi Wollbeck, Erlenbach, and Thomas Zang, Goldbach, both of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Aug. 3, 1981, Ser. No. 289,512

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032417; Jul. 10, 1981, 3127282

Int. Cl.³ F28F *11/00*

U.S. Cl. 165—70 11 Claims



1. Arrangement for heat and/or mass transfer from a minimum of one first liquid to a minimum of one second liquid by means of hollow fibers from spinnable synthetic polymers, comprising a housing having an internal surface, connections on said housing for supply and draining of the liquids, said housing defining a minimum of one additional liquid drain port, a hollow fiber module removably connected to said housing, said hollow fiber module containing open hollow fibers ends embedded in a casting compound bed having an external surface, said casting compound bed is interconnected by a minimum of one essentially rigid supporting element, an intermediate ring defining a minimum of one bore of essentially radial disposition, said intermediate ring is located between said casting compound bed of said hollow fiber ends and said housing, a minimum of two external gaskets arranged at a distance to each other between said intermediate ring and said internal surface of said housing, a minimum of two internal gaskets arranged at a distance to each other between said intermediate ring and said external surface of said casting compound bed, whereby said intermediate ring, said external gaskets and said internal gaskets define between said housing and said hollow fiber module a distributing chamber and a collecting chamber for said liquids, said minimum of one bore of essentially radial disposition of said intermediate ring ends between said external gaskets and said internal gaskets, said minimum of one additional liquid drain port arranged in said housing between said external gaskets.

4,480,684

HEAT EXCHANGER FOR AIR CONDITIONING SYSTEM

Toshiya Onishi; Susumu Oshima; Hiromi Mikata; Haruo Nakata, and Masami Horiuchi, all of Sakai, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

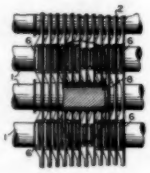
Continuation of Ser. No. 129,463, Mar. 11, 1980, abandoned.

This application Dec. 22, 1982, Ser. No. 452,149

Claims priority, application Japan, May 16, 1979, 54-65952

Int. Cl.³ F28F *1/42*

U.S. Cl. 165—110 4 Claims



1. A heat exchanger for an air conditioning system comprising:

a plurality of heat transfer tubes arranged substantially parallel to one another;

a plurality of fins secured to outer surfaces of said heat transfer tubes and extending outwards;

a refrigerant flow passage defined inside said heat transfer tubes; and

air passages each defined by the adjacent fins and extending past the outer surface of each of said heat transfer tubes, each of said air passages being substantially at right angles to the axis of each of said heat transfer tubes;

said fins being of a constructural form such that their coefficient of heat transfer to and from the air is over 1.2 times that of flat fins;

each of said heat transfer tubes being formed on the inner wall surface thereof with a multiplicity of spiral grooves;

said heat transfer tubes each having an outer diameter in the range between 6 and 16 mm;

said spiral grooves formed on the inner wall surface of each of said heat transfer tubes having a depth in the range between 0.1 and 0.6 mm and a pitch in the range between 0.2 and 0.6 mm;

the respective spiral ridges formed by the adjacent twos of said spiral grooves each having a sharp-apex V-shaped cross-section and a vertical angle in the range between 50° and 100°;

the spiral grooves formed on the inner wall surface of each of said heat transfer tubes each having a helical angle with respect to the axis of the tube in the range between 16° and 35°; and

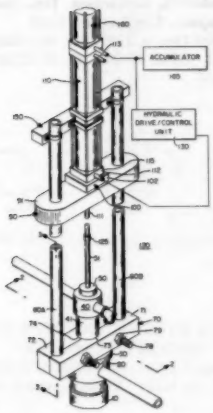
said heat exchanger being incorporated in a refrigerant circulating cycle of a heat-pump type so as to function selectively as a condenser and an evaporator therein.

4,480,685

OIL WELL PUMP DRIVING UNIT

Thomas A. Gilbertson, 216 Sandringham, N., Moraga, Calif. 94566

Continuation-in-part of Ser. No. 183,958, Sep. 3, 1980, Pat. No. 4,320,799. This application Dec. 24, 1981, Ser. No. 334,245
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.[3] F04B 47/04
U.S. Cl. 166—68.5 16 Claims



1. In an oil well pumping apparatus which includes a submerged reciprocating pump mounted in a tubing arrangement communicating with the wellhead, a sucker rod string extending through said tubing arrangement and connected in driving relation with said pump, and a pumping tee and stuffing box arrangement mounted on the casing of the well at the wellhead and including a sealed drive rod arrangement in the stuffing box connected in driving relation to said sucker rod string, a pump driving unit comprising:

an hydraulic cylinder, including a cylinder rod and an in/out hydraulic fluid line;

support means for supporting said hydraulic cylinder over said stuffing box with the axis of said cylinder rod aligned with the axis of said stuffing box;

coupling means for coupling said cylinder rod to said sealed drive rod arrangement; and

an hydraulic drive/control means coupled to said in/out fluid line for operating said hydraulic cylinder to produce an operating cycle consisting of an hydraulic power upstroke and a gravity power downstroke; said support means comprising a cylinder support assembly, including a cylinder support plate, and structural means mounting said cylinder support plate above said pumping tee and stuffing box arrangement in a plane generally perpendicular to the axis of said stuffing box, said cylinder support assembly further including gimbal means for supporting said cylinder in an axially floating manner on said cylinder support plate to adjust automatically the orientation of the axis of said cylinder into alignment with the axis of said stuffing box when the weight of said sucker rod string is applied to said cylinder rod, thereby to compensate for any small errors in the positioning of said cylinder support plate perpendicular to the axis of said stuffing box.

4,480,686

GAS LIFT MANDREL

Sidney G. Coussan, Lafayette, La., assignor to Daniel Industries, Inc., Houston, Tex.

Filed Jan. 10, 1983, Ser. No. 457,115
Int. Cl.[3] E21B 23/03
U.S. Cl. 166—117.5 7 Claims

1. A gas lift mandrel for installation in a string of production tubing extending into a well casing for production of petroleum products; said mandrel comprising:

(a) tubular body means having end portions adapted for connection to tubing sections making up said tubing string, said tubular body means defining a weld aperture in the side wall thereof;

(b) inner tubular sleeve means being secured within said tubular body means, said inner sleeve means defining elongated opening means in the wall structure thereof, said elongated opening means being of greater length as compared to the length of said weld aperture of said tubular body means; and

(c) valve receptacle means being positioned within said tubular body and said inner tubular sleeve and adapted to receive a gas lift valve mechanism in locked relation therewith, said valve receptacle means defining a weld boss at one side thereof extending through said elongated opening means and being positioned within said weld aperture and secured to said tubular body means at said well aperture by welding, said weld boss defining gas aperture means communicating said valve receptacle means with the well casing.

4,480,687

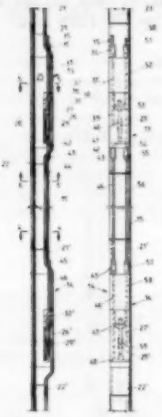
SIDE POCKET MANDREL SYSTEM FOR DUAL CHEMICAL INJECTION

Ben D. Terral, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 23, 1983, Ser. No. 468,929
Int. Cl.[3] E21B 37/06
U.S. Cl. 166—117.5 12 Claims

1. Apparatus for use in injecting chemicals or the like into the production tubing string of a well comprising: upper and lower mandrels connected in the tubing string in vertically spaced relationship, each of said mandrels having a normally closed pressure responsive control valve seated therein for controlling the flow of a chemical from externally of said mandrels; a first chemical flow path extending substantially through said upper mandrel and said lower mandrel and including an injection port in communication with the bore of said tubing string at a location adjacent the lower end of said lower mandrel, said control valve seated in said upper mandrel being arranged to control the flow of a first chemical through

said first flow path; and a second chemical flow path extending substantially through said upper mandrel and said lower mandrel and including an injection port in communication with the



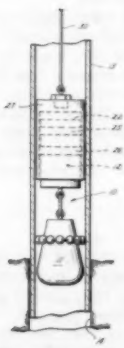
bore of said tubing string at a location adjacent the lower end of said lower mandrel, said control valve seated in said lower mandrel being arranged to control the flow of a second chemical through said second flow path.

4,480,688

METHOD AND BRIDGE PLUG FOR SEALING OFF A WELL

Herbert A. Rundell, and Ronald L. Campsey, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,096
Int. Cl.³ E21B *33/129*
U.S. Cl. 166—123 **2 Claims**



1. A bridge plug assembly adapted for sealing off a section of non-metallic tubing in a well comprising,

(a) body means,

(b) attaching means for securing said body means to said non-metallic tubing without damaging the non-metallic tubing comprising,

at lease one flexible sealing ring having overlapping ends fitted in a groove circumscribing said body means,

(c) releasable means for actuating said attaching means to body securing state,

(d) anchor means for restraining upward movement of said body means in said tubing, and

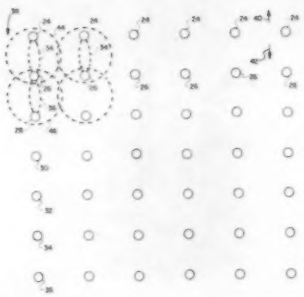
(e) said releasable means being responsive to upward movement thereof for actuating said attaching means for securing said body means to said non-metallic tubing for sealing off the lower section thereof.

4,480,689

BLOCK PATTERN METHOD FOR IN SITU GASIFICATION OF SUBTERRANEAN CARBONACEOUS DEPOSITS

Donald K. Wunderlich, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 6, 1982, Ser. No. 446,900
Int. Cl.³ E21B *43/243, 43/30;* **E21C** *43/00*
U.S. Cl. 166—245 **5 Claims**



1. A process for gasification of underground carbonaceous deposits comprising the steps of:

(a) positioning plural alternate substantially parallel contiguous rows of injection well bores and production well bores to establish a block gasification pattern;

(b) combustion linking each of said injection well bores with the production well bores adjacent thereto along oppositely directed paths substantially perpendicular to said rows;

(c) igniting said block pattern simultaneously through all said injection well bores; and

(d) gasifying said pattern along said oppositely directed linking paths.

4,480,690

ACCELERATED DOWNHOLE PRESSURE TESTING

Roy R. Vann, Katy, Tex., assignor to Geo Vann, Inc., Houston, Tex.

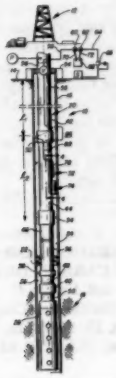
Continuation-in-part of Ser. No. 235,048, Feb. 17, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,565
Int. Cl.³ E21B *43/11, 47/06*
U.S. Cl. 166—250 **16 Claims**

1. A method for completing and/or testing a hydrocarbon formation of a well having a cased borehole, comprising the steps of:

running a string of production tubing into the borehole, said tubing string including a perforating gun on the lower end thereof, a valve above, but relatively near, the perforating gun, a packer apparatus below the valve, and a vent assembly below the packer apparatus;

setting the packer apparatus;

opening the vent assembly;
firing the perforating gun;
shutting-in the well at the valve; and



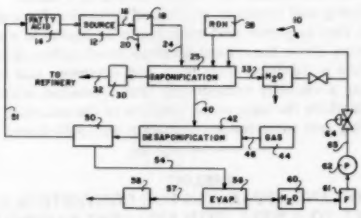
measuring the shut-in pressure within said tubing string below the valve.

4,480,691

RECYCLED FATTY ACID CRUDE PETROLEUM RECOVERY PROCESS

George L. Herter, 929 Third Ave., NW., Waseca, Minn. 59093, and Christian Herter, 1087 E. Third St., Apt. #5, Duluth, Minn. 55812

Filed Sep. 29, 1982, Ser. No. 427,134
Int. Cl.³ E21B *43/40*
U.S. Cl. 166—267 **25 Claims**



1. A method for recovering crude oil for subsequent refining, the method comprising the steps of:
(a) exposing a fatty acid to a source of raw crude oil;
(b) agitating said fatty acid with respect to or within the crude oil to produce a solvated crude oil mixture of reduced viscosity;
(c) saponifying said solvated crude oil mixture of step (b) by reacting the same with a nucliophilic base under pressure to separate the solvated crude oil mixture into petroleum crude and a fatty acid soap which migrates to an aqueous phase;
(d) separating said petroleum crude from said fatty acid soap of step (c);
(e) desaponifying said fatty acid soap to recover said fatty acid for subsequent recycling and reuse in conjunction with step (a), said desaponification step including the steps of:
(i) inputting said fatty acid soap in said aqueous phase into a high pressure containment vessel;
(ii) reacting said fatty acid soap with an acid for donating a hydrated proton within said vessel to reconstitute the fatty acid used in step (a);
(iii) separating the reconstituted fatty acid of step (ii); and,
(iv) recycling the recovered fatty acid of step (iii); into step (a).

4,480,692

PHOSPHORUS CONTAINING ESTER COSURFACTANTS IN ENHANCED OIL RECOVERY PROCESSES

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 27, 1982, Ser. No. 437,084
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—273 **9 Claims**

5. A process for hydrocarbon recovery from a subterranean formation comprising:
(a) injecting a surfactant system comprising a hydrocarbon sulfonate surfactant and a phosphorus containing ester selected from the group consisting of a phosphate ester represented by the formula

and a phosphite ester represented by the formula

and a phosphonate ester represented by the formula

wherein R is either a methyl, ethyl or propyl group into said formation via at least one injection well, and
wherein said surfactant is present in an amount of from about 0.10 to about 15 parts by weight and said cosurfactant is present in an amount from about 0.05–15 parts by weight thereby displacing the hydrocarbon present in said subterranean formation, and
(b) thereafter recovering the displaced hydrocarbon from said subterranean formation.

4,480,693

FLUID LOSS CONTROL IN OIL FIELD CEMENTS

John C. Newlove; Robert C. Portnoy, both of Houston, Tex.; Donald N. Schulz, Annandale, and Kissho Kitano, Fanwood, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 23, 1983, Ser. No. 565,158
Int. Cl.³ E21B *33/138*
U.S. Cl. 166—293 **7 Claims**

1. An aqueous slurry which comprises
(a) a cement; and
(b) about 0.05 to 5.0 wt% of a copolymer of N-vinylpyrrolidone and a salt of styrene sulfonic acid based on the dry weight of said cement;
(c) water, said cement and said copolymer being dispersed in said water to form said aqueous slurry.

4,480,694

METHOD FOR ACIDIZING HIGH TEMPERATURE SUBTERRANEAN RESERVOIRS

David J. Watanabe, Orange, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 27, 1982, Ser. No. 453,503
Int. Cl.³ E21B 43/27
U.S. Cl. 166—300 24 Claims

1. A method for acidizing a subterranean reservoir having a temperature above about 250° F., which comprises:

(a) introducing a treating fluid through a well into said reservoir, said treating fluid comprising a dispersion of (1) a mist of an acid precursor having a particle size of less than about 10,000 microns and an anhydrous gas in (2) water, and

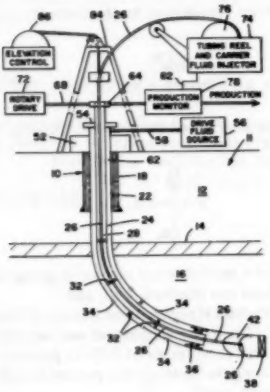
(b) allowing said acid precursor to hydrolyze in situ to generate a hydrohalic acid which reacts to increase the permeability of the said reservoir.

4,480,695

METHOD OF ASSISTING SURFACE LIFT OF HEATED SUBSURFACE VISCOUS PETROLEUM

Donald J. Anderson, Newport Beach, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 31, 1982, Ser. No. 413,326
Int. Cl.³ E21B 43/24
U.S. Cl. 166—303 5 Claims



1. A method for assisting the recovery of viscous petroleum from a subsurface petroleum-containing zone comprising:

(a) directionally drilling a well from the earth's surface into said subsurface petroleum-containing zone to position said well within said zone in a generally horizontal position;

(b) casing said well and perforating said casing at least in said generally horizontal portion thereof;

(c) placing a first tubular conductor within said casing and positioning the downhole end of said first tubular conductor adjacent to said perforations in said casing in said petroleum-containing zone nearest to the earth's surface end of said casing;

(d) injecting a hot fluid through said first tubular conductor into said perforated casing so as to heat said viscous petroleum adjacent to said perforated casing and to increase the mobility of said viscous petroleum to cause said heated viscous petroleum to flow into said casing through said perforations therein;

(e) placing a second tubular conductor within said first tubular conductor and positioning the downhole end of said second tubular conductor generally adjacent to the downhole end of said casing;

(f) placing a diverter between said casing and said first tubular conductor downhole from at least some of said perforations;

(g) injecting a driving fluid between said casing and said first tubular conductor and out of said at least some of said perforations to force said viscous petroleum toward said downhole end of said first tubular conductor;

(h) driving said viscous petroleum with said driving fluid toward said downhole end of said first tubular conductor;

(i) injecting a carrier fluid through said second tubular conductor to flow up to the earth's surface in the annular space between the inside of said first tubular conductor and the outside of said second tubular conductor, said flowing carrier fluid carrying said heated viscous petroleum to the earth surface.

4,480,696

FRACTURING METHOD FOR STIMULATION OF WELLS UTILIZING CARBON DIOXIDE BASED FLUIDS

Stephen W. Almond, and Phillip C. Harris, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 25, 1982, Ser. No. 436,763
Int. Cl.³ E21B 43/267
U.S. Cl. 166—308 18 Claims

1. A method of fracturing a subterranean formation penetrated by a well bore comprising:

admixing an aqueous liquid with liquid carbon dioxide and a selected surfactant comprising at least one member selected from the group consisting of alkyl quaternary amines, betaines, sulfated alkoxylates and ethoxylated linear alcohols to form a stabilized emulsion, said emulsion comprising from about 50 to in excess of about 96 percent by volume carbon dioxide and said surfactant being present in said emulsion in an amount sufficient to stabilize said emulsion;

introducing said emulsion into said well bore penetrating said subterranean formation at a temperature below the critical temperature of carbon dioxide and under sufficient pressure to maintain the carbon dioxide as a liquid;

maintaining said emulsion within said formation for a sufficient time to permit said emulsion to be heated to a temperature above the critical temperature of carbon dioxide to form a stabilized foam from said emulsion, said foam having a viscosity immediately after formation which is substantially the same as the viscosity of the emulsion; and

fracturing said subterranean formation with said foam.

4,480,697

METHOD AND APPARATUS FOR CONVERTING AN OIL WELL TO A WELL WITH EFFLUENT RAISING BY GAS-LIFT

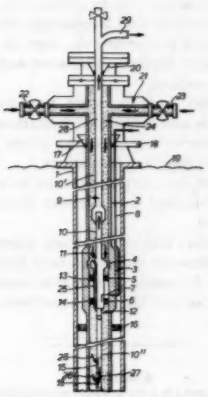
Goldaniga René F., Gignac; Géard Walter, Vaux le Penil; Bernard J. P. Glotin, Saint Maur, and Daniel Gallois, La Grande Paroisse, all of France, assignors to Compagnie Francaise Des Petroles, Paris, France and Slumberger Technology Corporation, New York, N.Y.

Filed Feb. 23, 1983, Ser. No. 469,054
Claims priority, application France, Feb. 26, 1982, 82 03198
Int. Cl.³ E21B 43/14
U.S. Cl. 166—372 18 Claims

1. A method of converting an oil well, which initially includes a production tube (2) for natural effluent rise, which production tube is fitted with a nipple (3) having a stop-groove (4) and smooth internal (5,6) bearing means between which a control line (8) originating from the surface opens, into an oil well with effluent raising by gas-lift of the effluent column, the method comprising lowering only once an inner tube (10) inside said production tube (2), said inner tube being fitted with a locking assembly (11) for locking said inner tube to said nipple, two seals (13,14) for sealing against said smooth internal bearing means, and safety valve means (12) capable of closing both a passage inside said inner tube and an annular passage (66) between said inner tube and said production tube, under

the action of a control fluid supplied between said seals, said lowering of said inner tube being continued until said inner tube is locked to the nipple, one of said passages being connected on the surface to a source of pressurised gas, the other of the said passages being connected to an effluent discharge pipe, said seals being applied against said smooth internal bearing means, and the safety valve means is opened.

2. Apparatus to be introduced into an oil-well production tube fitted with a nipple having a stop-groove, smooth internal bearing means and an inlet for a hydraulic control line between the smooth bearing means, for converting the oil well to an oil well with effluent raising by gas-lift of the effluent column, said apparatus comprising; an inner tube (10) having a boss (52) and provided with a locking assembly (11) which surrounds said inner tube, and which can undergo a longitudinal displacement relative to said inner tube if it is held during a descending movement of said inner tube, said locking assembly (11) comprising first and second retractable stopping means (30,39) such that, during a said relative longitudinal displacement, said boss (52) on said inner tube will move said first stopping means radially outwards, and said second stopping means will take up an engaged position (47) rendering said inner tube fast with said locking assembly, said inner tube also being provided with safety valve means comprising two outer seals (13,14), at least one control-fluid inlet (7) located between said two seals, longitudinal internal passage means (66) connecting the space outside said inner tube on either side, longitudinally, of the assembly comprising said two seals, first closing means (68) capable of closing or opening said longitudinal internal passage means, second closing means (76) capable of closing or opening the passage formed inside said inner tube, and hydraulic and mechanical transmission means between said inlet and said first and second closing means for operating said first and second closing means.

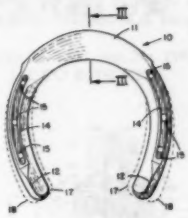


4,480,698

NICKEL-COATED ALUMINUM RACING HORSESHOE

Dennis J. Reeves, Toledo, Ohio, assignor to Farley Metals, Inc., Toledo, Ohio

Filed May 2, 1983, Ser. No. 490,855
Int. Cl.³ A01L 1/02
U.S. Cl. 168—4 15 Claims



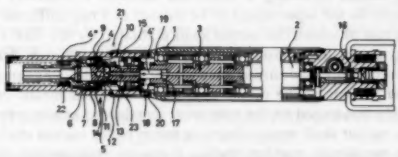
9. A cast aluminum alloy horseshoe having a nickel coating having a thickness between about 0.0005 and 0.005 inches, said alloy with said coating being bendable between about 5% and 10% of its original shape without fracturing.

4,480,699

COMPRESSED-AIR SCREWDRIVER WITH SHUTOFF BYPASS MEANS

Stefan Elmer, Oetisheim, Fed. Rep. of Germany, assignor to Firma Schmid & Wezel, Maulbronn, Fed. Rep. of Germany

Filed Sep. 11, 1979, Ser. No. 74,451
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840140
Int. Cl.³ B25B 23/145
U.S. Cl. 173—12 7 Claims



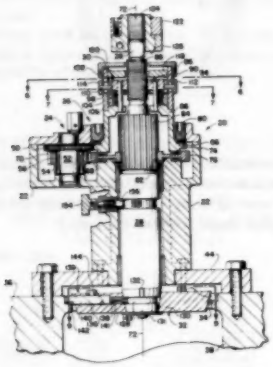
1. A compressed-air tool including a housing, a compressed air source, a tool spindle displaceably mounted in the housing, a spring connected to displace the tool spindle in a first direction, a motor connected to be driven by the compressed air source and to drive the tool spindle, an automatic shutoff having a valve which controls the connection of the motor to the compressed air source wherein the automatic shutoff is actuated by a torque responsive means to automatically turn off the motor when a predetermined torque is attained, further including:

an actuation means connected to the automatic shutoff to override the automatic shutoff and to turn the motor on after automatic turn off of the motor, wherein the actuation means upon inward axial displacement thereof overrides the automatic shutoff such that the tool spindle is displaced in a second direction to reopen the valve such that the compressed air tool is connected to the compressed air source to operate at a second torque which is greater than the predetermined torque.

4,480,700
MECHANICAL DIFFERENTIAL-RATE COUNTERBORING TOOL

Raymond L. Krieger, Denver, Colo.; Steven J. Volna, Minneapolis, Minn., and Edward T. Able, Denver, Colo., assignors to Sargent Industries, Inc., Los Angeles, Calif.

Filed Apr. 5, 1982, Ser. No. 365,510
Int. Cl.[3] B23B 47/18
U.S. Cl. 173—145 11 Claims



1. In a boring tool comprising input means for applying operational power to the boring tool, an output shaft adapted for operatively supporting a cutting tool therefrom, shaft rotating means operatively connecting the input means and the output shaft for rotating the output shaft, shaft advancement means operatively connecting the input means and the output shaft for axially advancing the output shaft, the shaft advancing means including a rotational member operatively connected to the input means to be rotated at a rate different than the rate at which the output shaft is rotated by the shaft rotating means, the output shaft including feed threads formed thereon, threaded means adapted for threadably engaging the feed threads of the output shaft, said threaded means operatively connected to the rotational member to axially advance the output shaft upon relative rotation of the output shaft and the rotational member during threaded engagement of the threaded means and the feed threads, and an improvement in combination therewith:

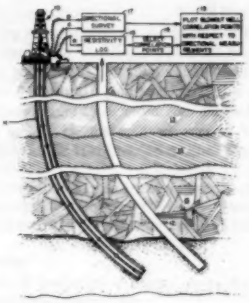
wherein said threaded means comprises a plurality of partial nut members, each partial nut member having a threaded surface adapted for engaging a portion of the feed threads of the output shaft, each partial nut member operatively connected to the rotational member to rotate with the rotational member and to move toward and away from the feed threads of the output shaft, the rotational member operatively retained to rotate about an axis coaxial with the rotational axis of the output shaft; and

further comprising means operatively contacting each partial nut member for selectively moving each partial nut member toward the output shaft to engage the threaded surface of the partial nut member with the feed threads of the output shaft and for selectively moving each partial nut member away from the output shaft to disengage the threaded surface of each partial nut member from the feed threads of the output shaft.

4,480,701
LOCATING THE RELATIVE TRAJECTORY OF A RELIEF WELL DRILLED TO KILL A BLOWOUT WELL

Willett Baldwin, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 8, 1982, Ser. No. 415,868
Int. Cl.[3] E21B 47/02
U.S. Cl. 175—45 11 Claims



1. A method of locating a relative trajectory of a relief well with respect to a blowout well intersecting subsurface formations at known depths comprising the steps of:

determining at what depths said blowout well intersects said subsurface formations;

logging said relief well for some measurable parameter which indicates said subsurface formations to produce a measured parameter log indicating where said relief well intersects said subsurface formations;

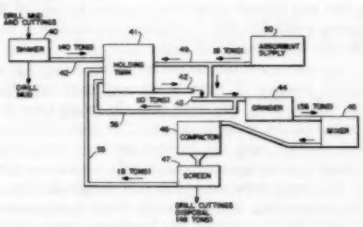
selecting from said log correlation points at which said relief well and said blowout well intersect the same subsurface formations; and

locating the relative trajectory of said relief well with respect to said blowout well from bore hole length differences between formation intersection depths in said relief well and blowout well taken between the same correlation points.

4,480,702
METHOD AND APPARATUS FOR DRILLING OIL WELL AND TREATING DRILLING MUD

John Kelly, Jr., Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 329,772, Dec. 11, 1981, abandoned.
This application Jun. 29, 1983, Ser. No. 508,767
Int. Cl.[3] E21B 21/06
U.S. Cl. 175—66 8 Claims



1. A method for drilling a well at an offshore location, comprising the steps of:

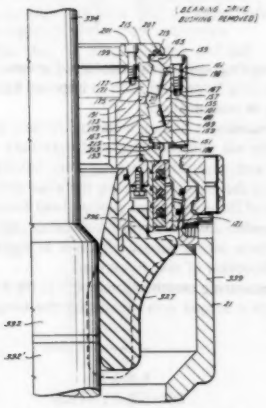
(a) drilling an offshore well through a subsurface formation which is substantially free of sand,

(b) circulating an oil base drilling fluid through the drilled well to remove the sand-free formation drill cuttings,
(c) separating the drilling fluid from the sand-free drill cuttings,
(d) grinding the sand-free drill cuttings to increase the surface area of said sand-free drill cuttings,
(e) mixing the ground sand-free drill cuttings free from otherwise-added oil absorbent material to enhance the absorption of the free oil adhering to said cuttings into the increased surface area of said cuttings
(f) compacting the mixed and ground cuttings, and
(g) disposing of the compacted cuttings at sea.

4,480,703
DRILLING HEAD

William R. Garrett, Conroe, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 69,341, Aug. 24, 1979, Pat. No. 4,304,310. This application Nov. 16, 1981, Ser. No. 321,937
The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.
Int. Cl.³ E21G *3/04*
U.S. Cl. 175—195 **4 Claims**

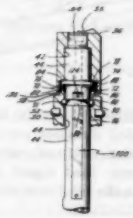


1. Drilling head comprising:
a tubular body having a bottom opening and a top opening and a side opening,
connector means at the bottom opening for connecting the body to the top of the next lower member of a drilling control stack,
top closure means for closing off the annulus between a portion of the body above said side opening and a drive tube when such a tube is extending through the body,
said top closure means including a stator releasably connected to the body, a rotor rotatably supported by the stator and having a stripper engageable with such drive tube and rotary seal means between said stator and rotor,
said rotary seal means comprising engaging cylindrical sliding surfaces provided by coaxial inner and outer annular portions,
said outer portion being affixed to said stator and said inner portion being affixed to said rotor,
one of said portions being a metal sleeve and the other of said portions being provided with axially separated compliant, non-metallic seal rings,
said drilling head further including lubricant passage means for conveying lubricant to said rotary seal means,
said lubricant passage means including:
a first portion in said body adapted for connection to a lubricator and
entirely in the stator a second portion which opens directly into the area between said inner and outer portions of the rotary seal means in between said axially separated compliant seal rings.

4,480,704
REAMER

James R. May, Spring, and Billy E. Black, Houston, both of Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Jul. 19, 1982, Ser. No. 399,414
Int. Cl.³ E21B *10/30*
U.S. Cl. 175—228 **21 Claims**



1. A wall-contacting apparatus useful in earth boring by the rotary method, comprising:
a body having at least one socket in its outer periphery;
upper and lower blocks disposed in said socket;
a shaft supported at each end by said upper and lower blocks;
a roller rotatably mounted on said shaft, said roller having a hole extending axially thereof through which extends said shaft, the inner periphery of said roller and the outer periphery of said shaft providing bearing means for said roller;
said shaft having a shoulder forming a downwardly facing first sealing surface disposed above said bearing means;
said roller having an upwardly facing second sealing surface opposite to said first sealing surface;
upper and lower sealing means disposed above and below said bearing means; and
said upper sealing means including a sealing member, said first sealing surface compressing said sealing member against said second sealing surface forming a facing seal between said shaft and roller.

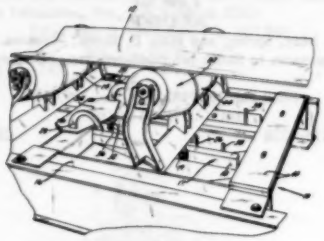
4,480,705
PLATFORM CALIBRATION FACTOR FOR CONVEYOR INCLINATION ANGLE

Theodore F. Raske, Germantown, and Phillip L. Lee, Greenfield, both of Wis., assignors to Rexnord Inc., Brookfield, Wis.

Filed Aug. 5, 1982, Ser. No. 405,641
Int. Cl.³ G01G *19/52;* G01L *25/00*
U.S. Cl. 177—50 **8 Claims**

1. A method for calibrating an instrument which measures the weight of material conveyed by a belt above the instrument, the instrument including a weigh bridge spaced below the belt and at an angle to the horizontal, the weigh bridge having a load cell spaced therebelow, the method comprising the steps of:
generating a horizontal base correction factor derived from a first static load signal corresponding to the weight of known weight on a load receiving member and a second static load signal corresponding the weight of said known weight generally placed above the load cell,
generating a second correction factor when said weigh bridge is at an angle to the horizontal derived from a third static load signal corresponding to the weight of said known weight on a load receiving member and a fourth

static load signal corresponding to the weight of said known weight generally placed above the load cell, generating an output signal when said weigh bridge is at said angle to the horizontal and said known weight is on the



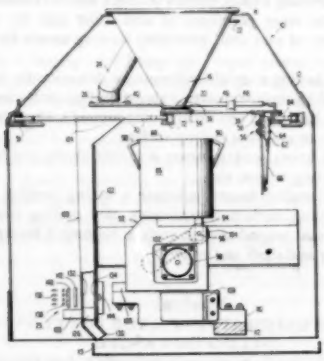
load receiving member while the conveyor belt is operating in an unloaded dynamic condition, derived from a predetermined relationship of said second correction factor and a dynamic load signal corresponding to said known weight on the load receiving member.

4,480,706

AUTOMATICALLY DETERMINING THE TEST WEIGHT PER BUSHEL OF GRAIN

Robert D. Rosenthal, Gaithersburg, Md., assignor to Trebor Industries, Inc., Gaithersburg, Md.

Filed Sep. 30, 1982, Ser. No. 428,817
Int. Cl.³ G01G *19/52, 23/00, 13/00*
U.S. Cl. 177—50 **7 Claims**



1. Apparatus for automatically providing test weight per bushel of grain, comprising:

(a) a supporting structure and housing,

(b) a test kettle having a smooth open top and being selected to receive a predetermined quantity of grain,

(c) means including weighing means supporting the test kettle in the supporting structure and housing,

(d) a filling hopper fixedly attached to the supporting structure and housing and having a bottom discharge opening spaced above the test kettle, the hopper having a capacity greater than the predetermined quantity of grain,

(e) movable means for selectively closing and opening the bottom opening of the filling hopper,

(f) a stroker movably mounted for vertical movement with its lower stroking edge slightly below the top of the test kettle,

(g) means for moving the stroker horizontally across the top of the test kettle, and

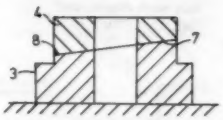
(h) a conduit for diverting a portion of the grain in the filling hopper, means closing and selectively opening an outlet end of the conduit, column means positioned within the housing and having an upper hopper below the outlet end of the conduit for receiving the diverted grain portion, and a near infrared instrument capable of measuring moisture, protein or other property of grain.

4,480,707

WEIGHING APPLIANCE, PARTICULARLY FOR MEASURING A GREAT WEIGHT WITH HIGH PRECISION

Hans W. Häfner, Aichach, Fed. Rep. of Germany, assignor to Pfister GmbH, Fed. Rep. of Germany

Filed Nov. 2, 1982, Ser. No. 438,902
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 3146021
Int. Cl.³ G01G *5/00, 5/04, 21/00*
U.S. Cl. 177—208 **14 Claims**



1. A weighing apparatus capable of measuring with high precision a very large load such as imposed by a large weight comprising in combination:

a force transducer having a stationary base member;

a rotatable nut unit engaging said stationary member;

said nut and stationary base member having helical work surfaces therebetween facing the axial direction of application of force due to an applied load forcing the stationary member and nut toward each other and converting the axial force into a torque effective at right angles to the axial direction of said force; and

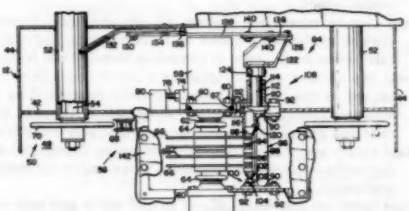
a force measuring member connected to the force transducer through a torque arm measuring the torque due to said force.

4,480,708

BRAKE SYSTEM

Jon A. Macht, and Brian C. Clark, both of Owatonna, Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Dec. 7, 1982, Ser. No. 447,666
Int. Cl.³ B62D *11/04*
U.S. Cl. 180—6.48 **8 Claims**



8. In a skid steer loader having separate transmissions with coaxial drive shafts for independently driving the wheels on opposite sides of the vehicle, a brake system comprising:

a plurality of brake discs, each brake disc being mounted for rotation on one of said drive shafts;

a caliper assembly, said caliper assembly including a trans-

verse bore and longitudinal slots overlying portions of said brake discs;

a plurality of brake pucks slidable within the transverse bore of said caliper assembly and located on opposite sides of said brake discs;

an axially adjustable stop positioned at one side of said caliper assembly in engagement with one endmost brake puck;

a slidable plunger disposed in the transverse bore at the other side of said caliper assembly in engagement with the other endmost brake puck;

a cam associated with said plunger, said cam having at least a partial spiral camming surface at one end and being mounted for rotation between engaged and released positions about an offset axis substantially parallel to the bore in said caliper assembly;

a manual lever for actuating said cam;

an arm connected to said cam; and

means for adjustably connecting said lever and arm to adjust rotational positioning of said cam relative to said plunger.

4,480,709

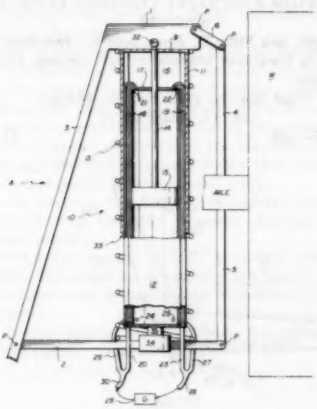
FLUID POWERED GENERATOR

Ephrem E. Commanda, P.O. Box 748, Sturgeon Falls, Ontario, Canada P0H 2G0

Filed May 12, 1982, Ser. No. 377,463

Int. Cl.³ B60K *25/10*

U.S. Cl. 180—65.3 **2 Claims**



1. A liquid powered generator mounted on a vehicle suspension which includes an "A" type frame having two arms comprising in combination:

an open ended cylinder emanating from one arm of the A frame by an enclosing cap end wall of said cylinder;

a sealed tube filled solely with liquid extending from another arm of the A frame and tightly disposed within said cylinder for reciprocating movement therein;

biasing means provided outside said sealed tube and said cylinder and abutting against both of the arms;

a closed chamber formed between said sealed tube and a top portion of said cylinder serving as cushioning and damping means when air contained therein is compressed by said reciprocating movement;

piston means on the one arm extending into said sealed tube, said piston means including a piston stem depending from and pivoted to the one arm and terminating in an annular piston disc slidably disposed within said sealed tube;

valve means above and below portions of said piston means, said valve means including inlet and outlet valves in each upper and lower portion of said sealed tube providing a double action;

at least two passageways integrally formed with said sealed tube on a longitudinal periphery thereof and providing fluid communication such that said upper inlet and outlet valves transfer fluidic pulses from and to an area adjacent said lower inlet and outlet valves respectively;

conduit means including inlet conduits emanating from a first common branch conduit to one of said passageways and to said inlet valve in said lower portion of said sealed tube and outlet conduits coalescing into a second common branch conduit from another of said passageways and from said outlet valve in said lower portion of said sealed tube; and

a generator disposed between said second common conduit and said first common conduit.

4,480,710

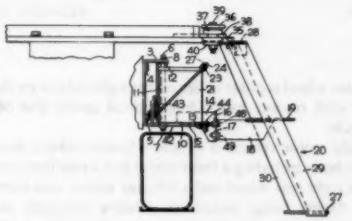
COMBINATION SWINGOUT BATTERY TRAY AND STEP

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Sep. 30, 1982, Ser. No. 430,013

Int. Cl.³ B60R *18/02*

U.S. Cl. 180—68.5 **8 Claims**



1. A pivotal step and battery tray mount for a vehicle comprising, a vehicle chassis, a battery tray, pivot means pivotally supporting said battery tray on said vehicle chassis for pivotal movement on a vertical axis between an operating position alongside said vehicle chassis to a laterally outwardly disposed servicing position, a latch operatively associated with said vehicle chassis and battery tray manually operable to releasably lock said battery tray to said vehicle chassis in the operating position of said battery tray and to release said battery tray from said chassis to permit swinging movement of said battery tray to its servicing position, a step, a step support rigidly secured to said battery tray and to said step for supporting the latter, a step mounting bracket on said vehicle chassis and releasable fastening means releasably securing an upper part of said step to said step mounting bracket in its operating position, release of said fastening means permitting pivoting of said battery tray and step to said servicing position of said battery tray.

4,480,711

FRONT SUSPENSION OF LIGHT VEHICLE

Kazuo Satoh, Saitama, and Katsuyoshi Kawasaki, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 426,249

Claims priority, application Japan, Oct. 29, 1981, 56-174340

Int. Cl.³ B62D *61/08*; B62K *5/02, 11/02*

U.S. Cl. 180—215 **2 Claims**

1. A front suspension of a light motor vehicle having a single front wheel supported on one side thereof with a supporting member disposed either on the right side or on the left side of said front wheel, wherein:

said front wheel is offset either on the right side or on the left

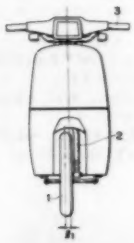
side with respect to the longitudinal center line of said vehicle;

said light motor vehicle is a two-wheeled vehicle;

the center of gravity of the vehicle body structure including a rear wheel is displaced either to the right or to the left of said center line of said vehicle; and

said front wheel is supported with said supporting member on the same side as said center of gravity with respect to said center line of said vehicle in a single support system, while said front wheel is offset to the side opposite to the side of displacement of said center of gravity.

2. A front suspension of a light motor vehicle having a single front wheel supported on one side thereof with a supporting member disposed either on the right side or on the left side of said front wheel, wherein:



said front wheel is offset either on the right side or on the left side with respect to the longitudinal center line of said vehicle;

said light motor vehicle is a three-wheeled vehicle having a front body including a front wheel and a rear body including a right rear wheel and a left rear wheel, said front and rear bodies being joined for relative swinging motion within a horizontal plane, said rear wheels being driving wheels differing from each other in driving force;

said front wheel is supported on one side thereof with said supporting member on the side opposite to the side of said rear wheel having a greater driving force with respect to said center line of said vehicle; and

said front wheel is offset to the same side as the front wheel supporting side with respect to said center line of said vehicle.

4,480,712

SUPERCHARGER APPARATUS IN MOTORIZED TWO-WHEELED VEHICLE

Kazuo Inoue, Tokyo; Minoru Matsuda, Chofu, and Takashi Shinozaki, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

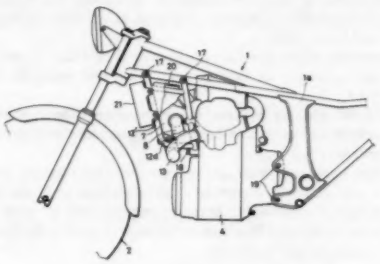
Filed Apr. 15, 1981, Ser. No. 254,269

Claims priority, application Japan, Apr. 15, 1980, 55-48589; Apr. 17, 1980, 55-49578

Int. Cl.[3] **F02D** *23/00*

U.S. Cl. 180—219 **6 Claims**

1. A supercharger apparatus in a motorized two-wheel vehicle comprising a vehicle body having a front wheel, a rear wheel and a supporting frame, an internal combustion engine mounted on said supporting frame, said engine including a supercharger comprising an exhaust turbine provided on an exhaust passage side of said engine and a compressor provided on an intake passage side of said engine for movement with said turbine; first connecting means for detachably connecting an upper end portion of said supporting frame to said vehicle body; and second connecting means for detachably connecting a lower end portion of said supporting frame to a front portion of said engine, said engine being mounted at the rear portion thereof to said vehicle body; wherein said supporting frame and said engine define a space therebetween and said supercharger is positioned in said space in front of said engine and below the top of said engine.



4,480,713

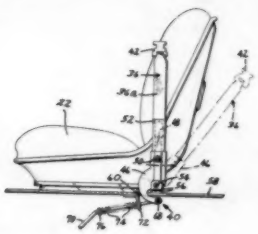
OPERATOR RESTRAINT/CONTROL LOCKOUT SYSTEM

Jon A. Macht, and Mike D. Jines, both of Owatonna, Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Nov. 16, 1982, Ser. No. 442,233

Int. Cl.[3] **B60R** *21/10*

U.S. Cl. 180—268 **12 Claims**



1. An operator restraint/control lockout system for a vehicle having a seat and a power device actuated by a control valve, comprising:

a seatbelt including a pair of seatbelt portions disposed on opposite sides of the seat, one seatbelt portion being fixed to the vehicle;

means for releasably fastening said seatbelt portions together;

a pivot arm connected to the other seatbelt portion;

said pivot arm being mounted for pivotal movement about a generally transverse axis between a forward position corresponding to fastened condition of said seatbelt across the seat, and a rearward position corresponding to unfastened condition of said seatbelt;

means for normally biasing said pivot arm toward the rearward position; and

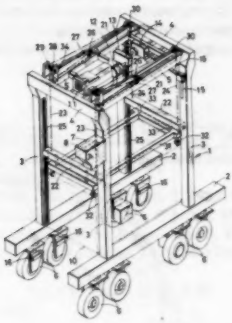
means responsive to pivotal positioning of said pivot arm for selectively disabling the control valve when said arm is in the rearward position.

4,480,714

SYSTEM FOR PREVENTING CARRIER FROM TURNING SIDEWAYS

Takenobu Yabuta, Takatsuki, and Takashi Sugata, Ryugasaki, both of Japan, assignors to Toyo Umpanki Co., Ltd., Osaka, Japan

Filed Jun. 8, 1982, Ser. No. 386,321
Claims priority, application Japan, Mar. 5, 1982, 57-35537
Int. Cl.³ B60R *21/00*
U.S. Cl. 180—290 **7 Claims**



1. A system for preventing a vehicle from turning sideways comprising:

means for measuring the weight of a cargo on the vehicle,

means for measuring the height of gravitational center of the cargo on the vehicle,

means for measuring the steering angle of the vehicle,

means for measuring the running speed of the vehicle,

means for determining the overall height of gravitational center of the vehicle and the cargo from the weight and the height of gravitational center of the vehicle and the measured weight and height of gravitational center of the cargo and deriving the static stability of the vehicle from the overall height of gravitational center,

means for deriving the dynamic instability of the vehicle during turning from the measured steering angle and running speed,

means for comparing the dynamic instability with the static stability and emitting a control signal when the instability is in excess of an allowable limit dependent on the stability, and

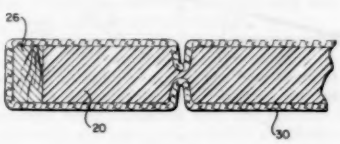
speed control means for the vehicle controllable by the control signal.

4,480,715

SIGHT AND SOUND BARRIER

George E. Brooks, 920 E. Silverlake Rd., Oak Harbor, Wash. 98277

Continuation of Ser. No. 249,129, Mar. 30, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 428,729
Int. Cl.³ E04B *1/344, 1/82;* B32B *3/30*
U.S. Cl. 181—287 **5 Claims**



1. A portable, free-standing sight and sound barrier comprising:

(a) an integral core of a lightweight, resilient foam which possesses cushioning and sound-absorbing properties, the core having alternating wall and hinge portions of foam defining a length of the barrier, the hinge portions allowing the barrier to assume smoothly curving configurations while the wall portions remain substantially straight and erect between successive hinge portions, each wall portion having a thickness sufficient to support the barrier when the barrier is placed on end, each hinge portion being defined by aligned pairs of grooves in spaced, substantially parallel array, each pair of grooves extending along the entire width of the barrier from end to end substantially perpendicular to the longitudinal axis of the barrier and impending by tapered side walls to substantially equal depths from opposite faces of the wall portions to form a thinned resilient hinge portion which is equally flexible in both directions; and

(b) a fabric cover adhered to the foam over the wall and hinge portions to cover substantially the entire surface of the foam, the cover being adapted to provide additional strength and resiliency for the hinge portions.

4,480,716

HIGH RISE ESCAPE DEVICE

Garry V. Soubry, 4316 Marina City Dr., Marina Del Rey, Calif. 90291, and James L. MacFarlane, 5848 Sinaloa Ct., Las Vegas, Nev. 89103

Filed Jun. 3, 1983, Ser. No. 500,977
Int. Cl.³ A62B *1/12, 1/16*
U.S. Cl. 182—233 **5 Claims**

1. A portable device for enabling a person to escape from a high rise building, comprising, in combination:

(a) an enclosed casing having substantially flat, parallel exterior walls;

(b) means secured to the casing for carrying said person;

(c) a spool rotatably mounted in said casing, said spool having a hollow interior chamber defined by walls;

(d) a cable carried on said spool with one end fixed to the spool and a free end passing out of said casing;

(e) means for attaching said free end to said high rise building so that said cable will be payed out from said spool as said casing and person descend;

(f) a fixed member in said hollow interior chamber of said spool having a plurality of flat exterior surfaces mounted in close proximity to corresponding flat parallel chamber wall surfaces, defining annular passages of constant volume between said exterior surfaces of said member and interior surfaces of said spool;

(g) a fixed shaft passing axially through said spool and having opposite ends secured to said opposing interior walls, the central portion of said shaft being secured to said member to hold it in fixed position rotationally and later-

ally, and plastic sleeve means for journalling said spool to said shaft for rotation and simultaneously acting as bearing means and providing sealing between said annular passage and exterior of said spool; and

(h) a viscous fluid completely filling said annular passage for retarding rotating of said spool by exerting a viscous friction force on the interior walls of said spool.

4,480,717

PREFABRICATED LUBRICANT UNIT

Bengt E. Legerius, Nyköping, and Hans W. Siebert, Oxelösund, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

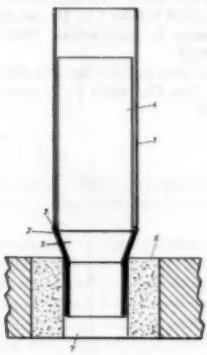
PCT No. PCT/SE82/00134, § 371 Date Dec. 6, 1982, § 102(e) Date Dec. 6, 1982, PCT Pub. No. WO82/03665, PCT Pub. Date Oct. 28, 1982

PCT Filed Apr. 23, 1982, Ser. No. 448,898

Claims priority, application Sweden, Apr. 24, 1981, 8102629

Int. Cl.³ F16C *33/10, 43/02*

U.S. Cl. 184—14 **2 Claims**



1. A lubricant unit intended for application between the contact surfaces of two bodies for reducing friction between them during displacement of the bodies relative each other especially in the case where one or both of the bodies comprises a porous material, said lubricant unit in an unapplied condition comprising at least one film (1,2) arranged with mutually opposing film surfaces, and a lubricant (3) deposited between these surfaces, such that after placing said unit between the bodies (4,6) to reduce the friction therebetween, the contact surface of at least one body is covered by film, whereby the necessary force for overcoming friction between the bodies will depend solely on the friction between a film surface coated with lubricant and a contact surface, or on the friction between two lubricant-coated film surfaces.

4,480,718

ENGINE LUBRICATING OIL LEVEL REGULATOR AND REPLENISH OIL WARNING SYSTEM

Ralph Marinelli, 2825 Vinsetta, Royal Oak, Mich. 48073

Filed Jun. 24, 1982, Ser. No. 391,943

Int. Cl.³ F01M *11/12*

U.S. Cl. 184—103 R **8 Claims**

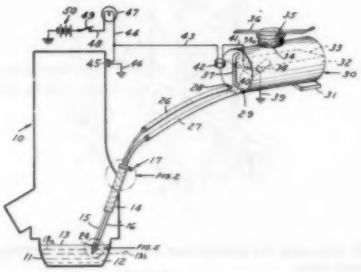
1. An engine lubricating oil level regulator for use with an engine having a low oil pressure indicator lamp and an oil sump with a dipstick tube, characterized in that said regulator includes:

(a) an air-sealed lubricating oil reservoir disposed above the level of the oil in an oil sump;

(b) at least two elongated tubes, having their upper ends connected to said reservoir and their lower ends disposed through the dipstick tube of an engine and into the oil sump and having an inner diameter of approximately one-tenth of an inch;

(c) means for positioning and sealing said elongated tubes in the dipstick tube with their lower ends at the functional oil level in the oil sump; and,

(d) means for filling the reservoir with oil, whereby the regulator senses oil consumption while the engine is operating by monitoring the functional oil level, and simultaneously supplying make-up oil through one of said two elongated tubes to the oil sump, in a drop-by-drop delivery rate which approximates the lubricating oil consumption rate of the engine, to maintain the functional oil level in the oil sump during operating of the engine, and wherein the regulator automatically provides an effective



shut-off valve function when the reservoir is being replenished because of the low delivery rate when the partial vacuum in the reservoir is broken and when the engine is turned off because in the one-tenth of an inch inner diameter tubes there occurs an inherent balancing action between the weight and mass of the column of lubricating oil within the tubes and the cohesive forces of the oil in the tubes, and the vacuum in the reservoir, which all function to create a balance of forces and a steady state condition, and a valve-opening function when the engine is started up because of the engine vibratory forces and weight of the column of oil in the tubes are larger than the cohesive and vacuum forces so that downward flow from the reservoir is initiated when the tubes are exposed to the atmosphere in the oil sump.

4,480,719

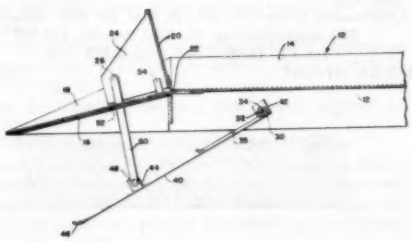
LIFT PLATFORM RETAINER

Melvin G. Risner, Carey, Ohio, assignor to REB Manufacturing, Inc., Carey, Ohio

Filed Aug. 17, 1982, Ser. No. 408,801

Int. Cl.³ B60S *13/00*

U.S. Cl. 187—8.52 **12 Claims**



1. A lift platform having a barrier plate hinged along the outer edge of the platform, said barrier plate movable from a position flush with the top surface of the platform to a position

substantially orthogonal thereto, said barrier plate having an upwardly extending orthogonal flange at one end thereof and a slot in said platform adjacent said flange, a ground-engaging lever pivoted at one end to said platform near said barrier plate, link means extending through said slot and pivoted to a point between the ends of said lever and to said end flange, and an adjustable helical spring means around said pivot of said lever to said platform for urging said lever downward from said platform and for urging said barrier plate into its upward orthogonal barrier position from the top surface of said platform, said ground-engaging lever moving said barrier plate into its nonbarrier position flush with the upper surface of said platform against the action of said spring when said ground-engaging lever is in contact with the ground and said platform rests on the ground.

4,480,720

BRAKE OPERATING DEVICE FOR A BICYCLE

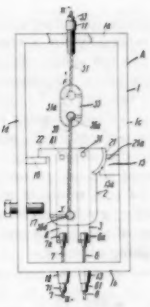
Keizo Shimano, Osaka, Japan, and Shimano Industrial Company Limited, 03, Osaka, Japan

Continuation of Ser. No. 183,444, Sep. 2, 1980, abandoned. This application Oct. 29, 1982, Ser. No. 437,862

Claims priority, application Japan, Sep. 8, 1979, 54-115495; Dec. 11, 1979, 54-161090; Dec. 11, 1979, 54-171979[U]; Mar. 28, 1980, 55-41042

Int. Cl.³ B62L *3/02, 3/08*

U.S. Cl. 188—24.15 **6 Claims**



1. A brake operating device for a bicycle brake having a front wheel brake for braking a front wheel of a bicycle and a rear wheel brake for braking a rear wheel of a bicycle, said device comprising,

(a) at least one control lever for operating said front and rear brakes,

(b) a movable control member operable in response to the operation of said control lever,

(c) means for transmitting an operating force of said control lever to said movable control member,

(d) a first brake wire for transmitting operation of said movable control member to said front wheel brake,

(e) a second brake wire for transmitting operation of said movable control member to said rear wheel brake,

(f) a first connecting member connecting said first brake wire to said movable control member,

(g) a second connecting member connecting said second brake wire to said movable control member,

said first and second connecting members being pivotally mounted on said movable control member, said means for transmitting being connected with said movable control member by a connecting means which establishes a connecting position for said transmitting means, said connecting position being at a side of said movable control member which is toward the connecting positions of said first and second brake wires to said connecting members and away from an opposite side of said movable member containing the pivot points of said first and second connecting members, said transmitting means being shifted at its connecting position with respect to the center between the pivot points of said first and second connecting members, so that, during the initial operation of said control lever, the connection position of said transmitting means moves in a direction away from said center to rotate said movable member in a first direction and increase an input force to said rear wheel brake at a higher rate than that of an input force to said front wheel brake and thereby actuate said rear wheel brake with a greater input force than applied to said front wheel brake, and after actuation of said rear wheel brake to a point where it begins to brake said rear wheel but before creation of skidding after cessation of rotation of said rear wheel, said connecting position of said transmitting means turns over through said center and said movable member rotates in a second direction opposite to said first direction to thereby increase an input force to said front wheel brake at a higher rate than that of an input force to said rear wheel brake and increase the total force applied to said front wheel brake to a point where it exceeds the total force applied to said rear wheel brake.

4,480,721

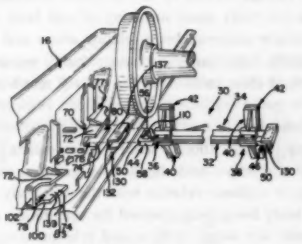
SNAP-ON SLIDE BEARING FOR RECESSED TYPE GUIDE LUGS OF UNIT BRAKE BEAMS

Richard F. Murphy, Batavia, Ill., assignor to Holland Company, Aurora, Ill.

Continuation-in-part of Ser. No. 382,220, May 26, 1982, abandoned. This application Sep. 23, 1982, Ser. No. 421,841

Int. Cl.³ B61H *13/24*

U.S. Cl. 188—52 **14 Claims**



7. A bearing structure for application to railroad car truck side frame unit brake beam guide lugs for mounting the unit brake beam thereof in the truck side frame guide lug guide slots that define the movement plane therefor for movement toward and away from the truck axle with engagement of the brake beam shoes with the axle wheel being serviced thereby when braking is effected, wherein such brake beam guide lugs each define upper and lower relatively flat, slide mount surfaces, of which the upper surface is formed to define a recess delineated by a generally flat floor and a marginal side wall in circumambient relation thereabout and having a configuration that in outline approximates the outline of the lug including the lug forward and rearward edgings, projecting end edging, and the brake shoe side of the lug,

said bearing structure being improved for confining application of the brake beam shoes to flush relation with the axle wheel being serviced thereby when braking is effected, said improved bearing structure comprising:

a plastic material body formed from a resiliently flexible polymer material of dry self lubricating antifriction characteristics,

said body being of elongate channel shaped configuration defining a web portion and spaced apart side walls, the inner surfacings of which define a mounting pocket for receiving the brake beam guide lug to be applied in same,

said web portion and said side walls being shaped and proportioned for complementing fit reciprocatory seating of said body in the truck side frame guide slots that are to mount the unit brake beam so as to dispose said body side walls in substantial parallelism with the respective guide slots,

said body spaced apart side walls having oppositely facing outer surfacings defined by said polymer material of said body,

said body outer surfacings being substantially coextensive therewith,

with said body outer surfacings being smooth and forming slide surfaces that are closely received within said guide slots in complementary face to face, cock free, but free slip fit relation thereto, when said body is seated in the guide slots,

said polymer material being characterized by said body side wall outer surfacings defined thereby being corrosion free and resistant to adherence thereto of foreign matter,

said body receiving the guide lug it is mounted on between said side walls thereof, with one side wall thereof at the upper slide mount surface of the guide lug and the body other side wall at the lower slide mount surface of the guide lug,

said body one side wall being formed to define lug means for snap fitting relation with and in the guide lug recess for lodging said lug means therein,

said body spaced apart side walls having opposed inner surfacings defined by said polymer material of said body,

with said body inner surfacing of said body one side wall being in circumambient relation about said lug means,

and said body inner surfacings being smooth and being spaced from each other for closely receiving the respective guide lug slide mount surfaces, respectively, in complementary face to face but free slip fit relation thereto for snap fit application of said body lug means in the recess of the respective guide lug and for gripping and holding the lug in coplanar relation with the said body,

said body being proportioned for orientation relative to the guide slot when in its seated relation therein to dispose same and the brake beam guide lug received therein, respectively, in coplanar alignment with the brake beam movement plane of the guide slot mounting same,

whereby, when the brake beam guide lugs of the brake beam are each mounted in a said bearing body and such bearing bodies are mounted in the side frame guide slots therefor, and braking is effected, the brake beam in being moved in either direction relative to the guide slots in which said bodies are mounted is disposed in coplanar relation with the guide slot movement plane therefor and is freely movable therealong, and the brake shoes of such brake beam on brake application are presented in flush relation to the axle wheel serviced thereby,

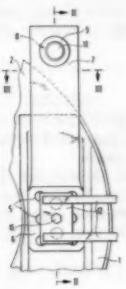
said polymer material being further characterized by said outer surfacings of said body that are defined thereby, effecting, through said face to face free slip fit relation relative to such guide slot, during said movement of the brake beam guide lug in the guide slot, resurfacing of the upper and lower surfaces of said guide slot, with said body outer surfacings and said guide slot resurfacings hardening in use, whereby same become effectively resistant against wear, in use, for maintaining said coplanar relation of the guide lug and the flush relation of presentation of the brake shoes to the axle wheel being serviced thereby.

4,480,722

SUSPENSION ARRANGEMENT OF MOVABLE PARTS, ESPECIALLY OF DISK BRAKES OF RAIL VEHICLES

Xaver Wirth, Ismaning, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,317
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1981, 3123640
Int. Cl.³ F16D 65/06
U.S. Cl. 188—59 9 Claims



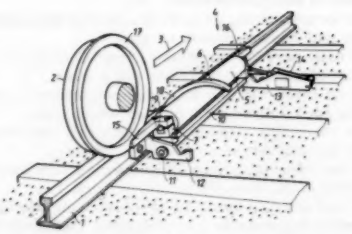
1. Suspension arrangement for actuation and abrasion dependent movable means, especially for a brake pad holder and non-rigid brake saddle of a rail vehicle disk brake having abrasion compensation means, said arrangement comprising at least one resilient suspension bracket (7, 7') extending from a said movable means (1; 19) to a rigid retaining means (10; 10'), said suspension bracket being resiliently deformable in the direction of movement of said movable means being rigidly connected to one of said movable means and said retaining means and being retained on the other of said movable means and retaining means by means of a sliding guide meachnism (8, 8') extending parallel to the direction of movement and being self-locking under stress load of a tilting moment.

4,480,723

MARSHALLING YARD RETARDER

Hakan Ingvast, and Bo Karlsson, both of Själevad, Sweden, assignors to AB Hägglund & Söner, Örnsköldsvik, Sweden

Filed Mar. 22, 1982, Ser. No. 360,784
Claims priority, application Sweden, Mar. 24, 1981, 8101869
Int. Cl.³ B61B 1/00; B61K 7/02; F61D 57/00
U.S. Cl. 188—62 5 Claims



1. A retarder system for railway wagons, comprising:
a track for railway wagons; and
a retarder device including
a cylinder rotatable about its axis and arranged substantially parallel to a rail of the track;
said cylinder being mounted for pivotal movement, about an axis parallel to the rail, from a wagon-retarding,

working position adjacent said rail, and out of said position away from the rail;

biasing means resiliently urging the cylinder towards said working position; and

a helically extending and radially projecting first flange, on the surface of said cylinder, provided with a wheel-contactable surface arranged to set the cylinder in rotation, when the latter is in its working position, under the influence of a rail-engaging wheel of a railway wagon travelling along the track in a first direction, the cylinder being angularly orientated relative to its axis in a position of readiness after being rotated by a wheel of a railway wagon travelling along the track in the first direction;

the cylinder being mounted so that a rail-engaging wheel of a railway wagon travelling along the track in a second direction, opposite said first direction, contacts the first flange and pivotally moves the cylinder, against the resilient urging of the biasing means, out of said working position to allow travel of the railway wagon along the track in the second direction; wherein the improvement comprises:

the provision of a second flange projecting radially from the surface of said cylinder in a direction toward the rail at a location to be contacted by the lowermost portion of a flange of a rail-engaging wheel of a railway wagon in the position of readiness of said cylinder, said second flange lying substantially parallel to the axis of said cylinder, extending partially along the length of said cylinder, and being spaced from said first flange, whereby said second flange cooperates with the flange of the rail-engaging wheel as it travels along the track in the second direction and prevents any substantial turning of said cylinder about its axis in the position of readiness when the first flange is contacted by the rail-engaging wheel and the cylinder is subsequently moved away from the rail out of said working position.

4,480,724

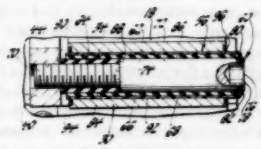
DISC BRAKE CALIPER MOUNTING SUSPENSION

Charles T. Hoffman, Jr., Waynesville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 22, 1983, Ser. No. 468,148

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.45 **2 Claims**



1. In a disc brake sliding caliper mounting arrangement for a disc brake assembly having a fixed member providing a mounting bracket, a caliper housing member, at least one mounting bolt having one end secured to one of said members, and the other member having a mounting boss provided with a bore therethrough which said mounting bolt extends, to support said caliper housing member in sliding and guiding relation on said fixed member, the improvement to provide a substantially corrosion-free sliding caliper suspension comprising:

a mounting bolt member and suspension member subassembly including

said mounting bolt having a fastening end section and a diametrically enlarged cylindrically formed guide support section, said guide support section having a circumferentially extending groove formed therein intermediately adjacent the mounting bolt end opposite said fastening end section;

a mounting sleeve over said fastening end section and having one end abutting said guide support section, said mounting sleeve providing an extension of the cylindrical outer surface of said guide support section over a part of said fastening end section;

a resilient rubber-like sleeve defining a support bushing received over said guide support section and said mounting sleeve in sealing relation thereto while leaving said groove uncovered; and a low coefficient of friction guide sleeve having a cylindrical body received over said support bushing in sealing relation thereto, one end of said guide sleeve having radially inward extending tab means snapped into said groove and retaining said guide sleeve axially fixed relative to said mounting bolt;

said subassembly having said fastening end section fastened into a coacting opening formed in said one member so as to be securely mounted on said one member;

said mounting boss bore having a cylindrically formed inner surface in slidable engagement with the outer cylindrical surface of said guide sleeve, and an annular wiper seal mounted at each end of said bore on said mounting boss with the inner annular surfaces thereof engaging said guide sleeve in surface wiping relation and sealing the ends of said bore against intrusion of corrosive materials;

said wiper seals, said guide sleeve and said support bushing cooperating to provide a substantially corrosion-free sliding caliper mounting suspension.

4,480,725

SPOT TYPE BRAKE WITH FLOATING CALIPER

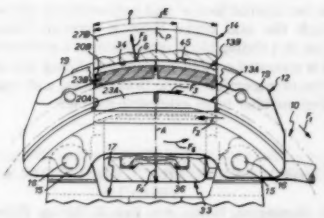
Gilbert Brimaud, Paris, France, assignor to Valeo, Paris, France

Filed Mar. 18, 1982, Ser. No. 359,601

Claims priority, application France, Mar. 25, 1981, 81 05957

Int. Cl.³ F16D *51/14;* **B60T** *11/10*

U.S. Cl. 188—76 **10 Claims**



1. A spot type crown or ring brake, said brake comprising a fixed support, a rotary cylindrical brake member having inner and outer braking surfaces, inner and outer brake pads disposed respectively radially inwardly and outwardly of said brake member, an operating member mounted for transverse movement relative to said brake member, said operating member including hydraulic actuating means for urging said inner brake pad along a generally transverse braking axis into operative engagement with said inner braking surface of said brake member and a bearing surface for urging said outer brake pad into operative engagement with said outer braking surface of said brake member, the center of area of said bearing surface being circumferentially offset relative to said braking axis and located behind said braking axis relative to the direction of rotation of said brake member, and said hydraulic actuating means being centered with respect to said inner brake pad.

4,480,726

ARRANGEMENT FOR AUTOMATIC ADJUSTMENT OF BRAKING GAPS IN DRUM BRAKES

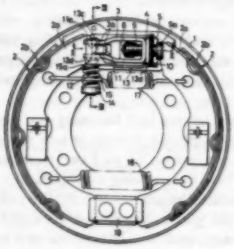
Isao Idesawa, Nagano, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Japan

Filed Nov. 9, 1981, Ser. No. 319,588

Claims priority, application Japan, Nov. 20, 1980, 55-166301[U]; Dec. 23, 1980, 55-185183[U]; Dec. 23, 1980, 55-185184[U]

Int. Cl.³ F16D 65/56

U.S. Cl. 188—79.5 P 5 Claims



1. An arrangement for automatic adjustment of a braking gap in a drum brake of the type in which a pair of brake shoes is expanded into engagement with the inside face of a brake drum, comprising in combination a brake lever which abuts at one end upon one brake shoe to cause extension of said shoe, a support shaft which is extensible at a right angle with said brake lever and includes a portion intermediate the ends thereof which is tapered in its extending direction and a head end, an adjusting lever which is loosely inserted over said support shaft and having one end abutting upon one end face of said brake lever and the other end being pawl-shaped, an adjusting gear for permitting extension of an adjusting member, said gear engaging with the other pawl-shaped end of said adjusting lever, and a compression spring interposed between the head of said support shaft and the said adjusting lever, a predetermined load applied on said spring causing said adjusting lever to be biased toward said brake lever and urged against the tapered face of said support shaft, the support shaft to which the said brake lever is secured being rotatably mounted on a sliding block in the form of a substantial U-shape, which is mounted on a back plate for sliding movement in the direction of expansion of the brake shoes, and supporting the adjusting member in an extensible manner.

4,480,727

ELECTROMAGNETIC TRACK BRAKE FOR A RAILWAY VEHICLE

Nils K. Bengtsson, Dalby, and Egil K. Ljung, Bjärred, both of Sweden, assignors to SAB Industri AB, Landskrona, Sweden

PCT No. PCT/SE81/00331, § 371 Date Jul. 16, 1982, § 102(e) Date Jul. 16, 1982, PCT Pub. No. WO82/01691, PCT Pub. Date May 27, 1982

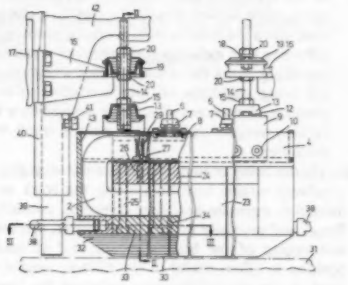
PCT Filed Nov. 10, 1981, Ser. No. 403,498

Claims priority, application Sweden, Nov. 19, 1980, 8008097

Int. Cl.³ F16D 65/34

U.S. Cl. 188—165 7 Claims

1. An electromagnetic track brake to be mounted on a railway vehicle for co-operation with a rail and comprising in combination, an elongate brake energizing coil having a lower disposed branch to be disposed generally parallel to the rail, a rigid frame therefor, a plurality of generally U-shaped braking shoes mounted in a row in the frame around the lower branch of the coil and having braking surfaces disposed beneath the coil for frictionally engaging the rail when the coil is energized, means mounting each braking shoe individually movable in a vertical direction relative to the frame and lightly spring biased upwards away from the rail towards a rest position, said track brake being mounted on a vehicle frame, a tie rod extending exteriorly along the lower branch of the coil, a covering therefor and engaging each of the braking shoes for



the transmission of braking reaction forces from the shoes to the tie rod, and means rigid with the vehicle frame and operatively connected to the end of said tie rod to take up the braking reaction forces transmitted to the tie rod.

4,480,728

RETARDER BRAKE CONTROL

Keith A. Bailey, and Stephen F. Spurlin, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1982, Ser. No. 441,604

Int. Cl.³ F16F 11/00

U.S. Cl. 188—271 5 Claims

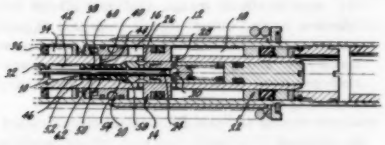
Fig. 2a | Fig. 2b

1. In a control for an output shaft connected retarder assembly having a friction brake portion and a hydrodynamic brake portion wherein a net friction brake apply pressure is equal to the difference between a friction brake apply pressure and a hydrodynamic brake charging pressure, the combination comprising, a first valve means providing a first hydraulic pressure regulated according to a first schedule such that said first pressure has a constant maximum first magnitude at output shaft speeds above a first reference speed and a plurality of first intermediate magnitudes generally proportional to speed at output shaft speeds below said first reference speed, a second valve means providing a second hydraulic pressure regulated according to a second schedule such that said second pressure has a constant maximum second magnitude equal to said maximum first magnitude at output shaft speeds above a second reference speed exceeding said first reference speed and a plurality of second intermediate magnitudes generally proportional to speed at output shaft speeds below said second reference speed, each of said intermediate second magnitudes being less than the corresponding one of said maximum first magnitude and said intermediate first magnitude so that the difference between said first and said second pressure magnitudes increases as output shaft speed decreases from said second reference speed to said first reference speed, and means directing said first pressure to said friction brake portion thereby to establish said friction brake apply pressure therein and directing said second pressure to said hydrodynamic brake portion thereby to establish said hydrodynamic charging pressure therein.

4,480,729
ANTI-SURGE VALVE FOR HYDRAULIC LOCKING DEVICE

Clyde R. Porter, Los Angeles, Calif., assignor to P. L. Porter Company, Woodland Hills, Calif.

Filed Oct. 3, 1979, Ser. No. 81,398
Int. Cl.³ F16F 9/34
U.S. Cl. 188—300 **10 Claims**



1. An anti-surge valve to permit a fluid to flow at low velocity into and out of a port that opens into a cylindrical chamber, the port located on the concave wall that defines the cylindrical chamber, and to prevent a high-velocity flow of the fluid from the cylindrical chamber into the port, said anti-surge valve comprising in combination:

a sealing tube positioned within the cylindrical chamber in juxtaposition with the port and including a cylindrical outer surface coaxial with but spaced radially inward of the portions of the concave wall that surround the port;

spacer means for maintaining the cylindrical outer surface of said sealing tube spaced from the concave wall in the absence of fluid flow to provide a space for the fluid to flow through in passing between the port and the cylindrical chamber, inlet means into said space for producing fluid flow generally parallel to said sealing means, whereby such a flow of fluid causes the cylindrical outer surface of said sealing tube to be urged toward the portions of the concave wall that surround the port by a force related to the velocity of the flow;

said sealing tube consisting of an elastic material and being sufficiently stiff that at low flow velocities said sealing tube is not drawn toward the concave wall sufficiently to diminish substantially the space between said cylindrical outer surface and the portions of the concave wall that surround the port, but being sufficiently flexible that at high flow velocities the cylindrical outer surface of said sealing tube is drawn against the portions of the concave wall that surround the port so as to seal the port to prevent high-velocity flow of the fluid from the cylindrical chamber into the port.

4,480,730
SHOCK ABSORBER UNIT FOR VEHICLES

Manfred Koller, Euerbach-Obbach; Hermann Itzinger, Dittelbrunn; Günther Handke, Euerbach; Karl Gottwalt, Schweinfurt, and Robert Eusemann, Bergrheinfeld, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,315
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128723
Int. Cl.³ F16F 9/36
U.S. Cl. 188—315 **11 Claims**

1. In a shock absorber unit to be used particularly as an insert for a compression strut comprising

a cylinder (1) having an axis and first and second ends, respectively, and defining a cavity (30) therein;

a piston rod guiding and sealing unit (4,5) adjacent said first end of said cylinder and including a piston rod guiding member (4), said piston rod guiding member (4) having an end face axially directed away from said second end of said cylinder and a radially outer surface;

a piston unit (3) within said cavity (30) dividing said cavity (30) into two working chambers (30*a*, 30*b*);

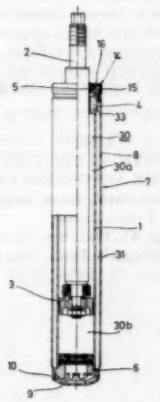
a piston rod (2) connected to said piston unit (3) within said cavity (30) and extending through said guiding and sealing unit (4,5);

a substantially cylindrical container (8) having a substantially constant wall thickness along its axial length having first and second ends, respectively, adjacent said first and second ends of said cylinder (1), respectively, and surrounding said cylinder (1) such as to define a compensation chamber (31) outside said cylinder (1), said container (8) being closed at its second end by a bottom wall (9);

a bottom valve unit (6) adjacent said second ends of said cylinder (1) and said container (8) providing a flow passage between said cavity (30) and said compensation chamber (31);

said cylinder (1) being centered and axially fixed between said bottom wall (9) of said container (8) and a substantially axially directed abutment face (33) of said piston rod guiding member (4);

said first end of said container (8) engaging said radially outer surface of said piston rod guiding member (4) and having an axially directed terminal edge at an axial location along said radially outer surface and free of engagement with said piston rod guiding member in axial direction;



a closure cap (14) being provided and including a sleeve member (15) and a cover section (16), said cover section (16) engaging said end face of said piston rod guiding member (4) and said sleeve member (15) engagingly surrounding the radially outer surface of said container (8) adjacent said first end thereof;

said radially outer surface of said piston rod guiding member (4) being provided with at least one of radial recesses (11) and radial projections (12), said container being provided with a deformation facing said one of said recesses (11) and said projections (12), respectively, both radially and axially, said sleeve member (15) being also provided with a deformation (17), said deformation (17) of said sleeve member (15) facing said deformation of said container (8) both radially and axially;

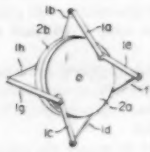
said cavity (30) being filled with a damping liquid;

said compensation chamber (31) being partially filled with said damping liquid and partially with gas.

4,480,731
VIBRATION DAMPING APPARATUS

Jiro Izeki, Tokyo, and Ikuo Shimoda, Fujisawa, both of Japan, assignors to Oiles Kogyo Kabushiki Kaisha, Japan

Filed Feb. 26, 1982, Ser. No. 352,600
Claims priority, application Japan, Feb. 27, 1981, 56-27731; Mar. 20, 1981, 56-39612; Apr. 16, 1981, 56-57716
Int. Cl.³ F16D *57/02*
U.S. Cl. 188—381 **6 Claims**

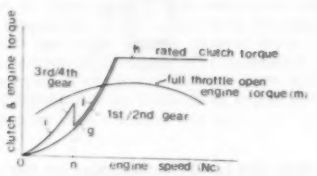


1. A vibration damping apparatus comprising two rotatable members disposed opposite to each other while defining a gap therebetween so as to be rotatable relative to each other around substantially a single axis of rotation, a resistive body disposed in the gap between said rotatable members, and four pairs of link bars, each link in each pair of link bars being pivoted to each other at one end thereof by a pin and coupled to said rotatable members in such a relation that the end of one of said link bars in each pair and the end of the adjoining one of said link bars in the next adjacent pair are coupled by pin means to the associated one of said rotatable members.

4,480,732
ELECTRO-MAGNETIC CLUTCH CONTROL SYSTEM FOR AUTOMOBILES

Toshio Takano, Hamuramachi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,063
Claims priority, application Japan, Sep. 12, 1980, 55-127699
Int. Cl.³ B60K *41/28*
U.S. Cl. 192—0.052 **10 Claims**



1. In a system for controlling an electromagnetic clutch of an internal combustion engine mounted on a car, which has a drive member secured to a crankshaft of said internal combustion engine, a driven member adjacent to said drive member, a magnetizing coil in one of said members, a transmission operatively connected to said driven member and having operatively selectable change gears, the improvement comprising

an engine speed sensor means for producing a first output signal when the speed of said engine is higher than a predetermined speed and inverting said first output signal when the speed of said engine is lower than the predetermined speed,

a transmission sensor means for producing a second output signal when one of said change gears having a small reduction ratio is selected and inverting said second output signal when one of said change gears having a high reduction ratio is selected,

an engine speed signal generator means for producing a third output signal in response to the speed of said engine, and an electric circuit comprising,

a driving circuit means responsive to an input signal, the latter being dependent on said third output signal and on a correction signal, for controlling current passing through said magnetizing coil so as to control said current dependent on said third output signal and on said correction signal,

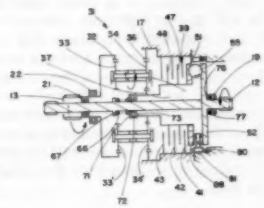
a correcting circuit means including a gate circuit and an RC control circuit means, said gate circuit being responsive to said output signals from said engine speed sensor means and said transmission sensor means, respectively, and said RC control circuit means being responsive to a respective output of said gate circuit for providing said correction signal,

said gate circuit and said RC control circuit means being so arranged that, upon said gate circuit receiving said first and second output signals, said correcting signal has a first value such that said current is decreased dependent on said first value and dependent on said third output signal to provide a small clutch torque, and said gate circuit and said RC control circuit means being so arranged that, upon said gate circuit receiving said second output signal and the inverted of said first output signal, said correcting signal has a second value such that said current is increased dependent on said second value and dependent on said third output signal to provide a great clutch torque.

4,480,733
ENERGY ABSORBING BIDIRECTIONAL RATCHET NO-BACK APPARATUS

Duane H. Grimm, and William J. Michaels, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 4, 1981, Ser. No. 260,483
Int. Cl.³ B60T *7/12*
U.S. Cl. 192—8 R **12 Claims**



1. An energy absorbing bi-directional no-back apparatus including in combination:

a fixed support, a rotatable input member and a rotatable output member,

said input member including an input plate having integral therewith a pair of release pins,

an output plate coupled to said output member, said input plate and said output plate having a torque transmission means coupled therebetween,

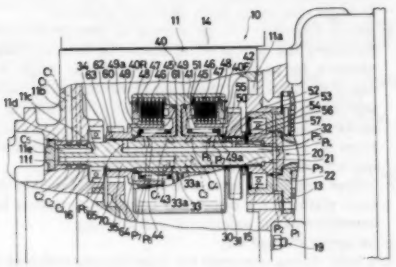
said fixed support having an energy absorbing ring means positioned between said input and said output plate,

said output plate having thereon, a pair of moveably mounted pawl members biased towards said energy absorbing ring means for cooperative engagement with said energy absorbing ring means to thereby engage said energy absorbing ring means when said apparatus is at rest, said pair of release pins positioned adjacent said pawl members such that whenever a backdriving load is delivered from said output member to said output plate, said pawl members are released from said energy absorbing ring means by cooperative engagement with said release pins upon bidirectional rotation of said input member.

4,480,734
HYDRAULICALLY OPERATIVE CLUTCH TYPE TRANSMISSION

Norikatsu Ishikawa, Takahama, and Choji Furusawa, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 7, 1982, Ser. No. 395,927
Claims priority, application Japan, Jul. 7, 1981, 56-106065
Int. Cl.³ F16D *25/10, 13/76, 23/14*
U.S. Cl. 192—20 **4 Claims**



1. A hydraulically operative clutch type transmission comprising;

a casing accommodating shift gear mechanism therein,

a housing connected to said casing so as to close an opening formed in an axial portion of said casing and accommodating a coupling device to transmit power from engine therein,

an input shaft journalled to said housing by means of an antifriction bearing,

a main shaft connected to said input shaft at one end thereof and journalled to a boss portion formed in side wall of said casing by means of an antifriction bearing,

a hydraulically operative clutch device mounted on said main shaft and energized by pressurized fluid which is transmitted by a control arrangment provided on said casing through a passageway formed in said main shaft,

a gearing means for transmitting power to an output member from said clutch device,

said clutch device further comprising a clutch drum mounted on said main shaft and a clutch hub connected to said gearing means,

a washer plate interposed between said gearing means and a sleeve end of said clutch drum and fastened on said main shaft only in its rotatable direction.

4,480,735
CAM ACTUATED CONTROL FOR MATERIAL UNLOADER

Larry J. Pingry, Celina, Ohio, assignor to The Paul Revere Corporation, Coldwater, Ohio

Filed Sep. 27, 1982, Ser. No. 423,616
Int. Cl.³ A01C *15/12;* **G05G** *9/12;* **F16D** *47/02, 23/12*
U.S. Cl. 192—48.3 **5 Claims**

1. Means for controlling a pair of clutches comprising:.

first clutch means having a first lever rotatable about a pivot for actuating said first clutch means, said first clutch means also having a stop limiting the counterclockwise rotation of the first lever;

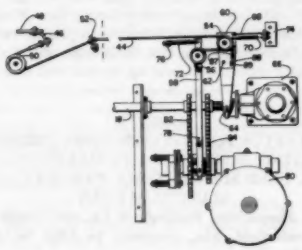
second clutch means having a second lever rotatable about a second pivot for actuating said second clutch means;

first spring means for biasing said first lever in a clockwise position;

second spring means for biasing said second lever in a counterclockwise position, the force required to extend the first spring means being less than the force required to extend the second spring means;

cable means connecting both the first and second levers and for preferentially rotating the first lever counterclockwise thus extending the first spring and then rotating the second lever clockwise extending the second spring after the first lever comes to rest on its counterclockwise stop; and

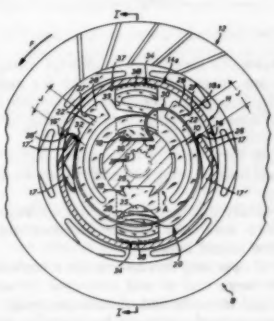
sequencing means for pulling and relaxing said cable in predetermined steps whereby one or more of said levers is moved in predetermined sequences.



4,480,736
TORSIONAL DAMPERS

Pierre Loizeau, Ville d'Avray, France, assignor to Valeo, Paris, France

Filed Jan. 28, 1982, Ser. No. 343,578
Claims priority, application France, Feb. 4, 1981, 81 02110
Int. Cl.³ F16D *3/14, 3/77, 3/79*
U.S. Cl. 192—106.1 **19 Claims**



1. A torsional damper for use in a friction clutch plate, said torsional damper comprising at least two coaxial parts mounted for relative rotation within a defined range of relative angular movement, circumferentially acting elastic means operatively disposed between said coaxial parts and resisting relative angular movement over at least part of said range of relative angular movement, said circumferentially acting elastic means comprising a circumferentially acting spring having one end in engagement with one of said coaxial parts and another end coupled to the other of said coaxial parts, said circumferentially acting spring being operative at the outset of relative angular movement, said circumferentially acting elastic means further comprising at least one elastically deformable arm, a support constrained to rotate with a first of said coaxial parts, a shoulder formed on a second of said coaxial parts, said elastically deformable arm extending in a substantially circumferential direction and attached at one end to said support, the other end of said elastically deformable arm having a shoulder being circumferentially spaced from said shoulder on said

second coaxial part at the outset of relative angular displacement of said coaxial parts, whereby said shoulders come into engagement with each other and said elastically deformable arm becomes operative after a predetermined range of relative angular movement between said coaxial parts, said elastically deformable arm and said support being parts of a flange of one-piece construction, wherein said first coaxial part comprises a hub and said support comprising a foot in engagement with said hub, said support further comprising two bearing arms extending in opposite directions from said foot and circumferentially around and bearing against said hub.

4,480,737

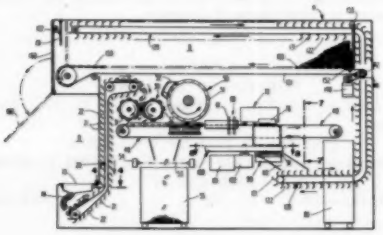
APPARATUS FOR RECOGNIZING, CRUSHING SEPARATING, WEIGHING AND MAKING PAYMENT FOR, USED METAL ITEMS, PARTICULARLY ALUMINUM CANS

Herbert H. Jamgochian, Wallingford, Pa., and Joseph L. Levasseur, Chesterfield, Mo., assignors to ARA Services, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 242,930, Mar. 12, 1981, abandoned. This application Jan. 31, 1983, Ser. No. 462,463

Int. Cl.[3] **G07F** *7/06*

U.S. Cl. 194—4 C **23 Claims**



1. Apparatus for identifying aluminum items, particularly aluminum cans, in municipal trash and for making payment automatically in coins on the basis of automatically measured weight, said apparatus comprising a housing having therein a plurality of components including:

a. a hopper for receiving trash items, including aluminum cans, said hopper being accessible from the exterior of said housing;

b. an upwardly disposed driven first conveyor operatively associated with said hopper for receiving trash items deposited in said hopper;

c. a pair of opposing driven crusher wheels located below the discharge end of said conveyor for crushing items discharged from the end of said conveyor;

d. a driven second conveyor horizontally disposed below said crusher wheels for receiving the crushed items;

e. a driven rotating magnetic wheel above said second conveyor, said wheel having magnetic components of sufficient strength to lift ferrous items from said second conveyor and to carry said ferrous items on the surface of said magnetic wheel;

f. scraper means on the upper surface of said magnetic wheel for discharging ferrous items therefrom;

g. a bin for receiving said ferrous items discharged from said magnetic wheel;

h. means establishing an alternating electromagnetic field in the path of said second conveyor whereby items travelling on said conveyor pass through said field;

i. identification means for identifying aluminum items passing through said electromagnetic field and for generating an electric signal in response thereto;

j. a reciprocable ram mounted at one side of said second conveyor adapted for rapid movement across said second conveyor;

k. control means responsive to said generated electric signal for causing said ram to extend across said second conveyor to push an identified aluminum item off the side of said second conveyor;

l. a platform weighing scale positioned at the side of said horizontal conveyor having a platform for receiving aluminum items pushed off said second conveyor by said ram;

m. a horizontally disposed segmented wheel having a plurality of open sectors defined by radial spokes, a first of said sectors positioned just above said scale platform, said aluminum items pushed from said second conveyor falling through said sector onto said scale platform;

n. means responsive to an interval of preselected duration following the arrival of an aluminum item on said scale platform for generating electric signals to trigger a readout of the total weight on said platform and to index said segmented wheel through one sector, the trailing radial spoke of said first sector pushing said weighed aluminum items off of said scale platform, and a second sector moving into place above said scale platform;

o. means responsive to said readout of total weight on said scale platform for dispensing coins into a payout hopper accessible to the exterior of said housing;

p. an upper storage bin;

q. a third driven conveyor for receiving the weighed aluminum items pushed from said scale platform, said third conveyor carrying said aluminum items vertically upwardly at the rear of said housing and then horizontally forwardly whereby the aluminum items carried on said third conveyor are discharged downwardly into said upper storage bin;

r. a movable sectionalized floor in said upper storage bin;

s. a movable rear wall in said upper storage bin secured to said movable floor;

t. a discharge door at the forward end of said upper storage bin;

u. manual control means for opening said discharge door;

v. manual control means for moving said movable floor forwardly to move said rear wall forwardly, thereby to push the aluminum items in said upper storage bin out through said open discharge door.

4,480,738

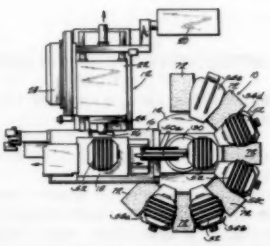
WORKPIECE STORAGE AND SHUTTLE APPARATUS

Clyde E. Mattson, Waukesha, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Jan. 18, 1982, Ser. No. 339,895

Int. Cl.[3] **B65G** *47/00*

U.S. Cl. 198—339 **4 Claims**



2. In an article transfer mechanism for transferring workpieces from one support to another, a base, a carousel rotatably supported on said base, a transfer bar slidably supported by said carousel for rotation therewith, power means coupled to said transfer bar for slidably moving it relative to said carousel in a rectilinear movement between an extended position for reaching a workpiece on a support and a retracted position for moving the workpieces off of the support and onto said carou-

sel or in a reverse direction for moving them off of said carousel and onto a support, a latch fixed to the workpieces, and securing means at the end of said transfer bar adapted to move into and out of engagement with said latch by an arcuate movement of said transfer bar in its extended position and produced by a rotary movement of said carousel for coupling and uncoupling the workpiece to said transfer bar while the workpiece is on a support.

4,480,739

METHOD AND APPARATUS FOR SEPARATING, ORDERING AND FEEDING METALLIC WORKPIECES

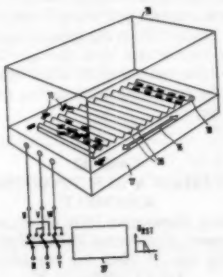
Jochen Haeusler, Nürnberg-Laufamholz, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 221,252, Dec. 30, 1980, abandoned. This application Mar. 8, 1983, Ser. No. 472,873

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002168

Int. Cl.³ B65G *35/00*

U.S. Cl. 198—381 **4 Claims**



1. Apparatus for separating and ordering metallic workpieces from a disorganized pile of workpieces comprising:

(a) a three-phase linear motor stator encased within non-magnetic material for generating a travelling electromagnetic field;

(b) a non-metallic orienting device disposed over said linear motor stator, said orienting device containing a plurality of grooves matched to the workpieces and at right angles to the travelling electromagnetic field such that when the electromagnetic field is generated the workpieces will be agitated by the grooved surface, will be separated from one another, and will be aligned in the grooves; and

(c) a non-magnetic hood disposed over said orienting device enclosing the space around said stator.

4,480,740

APPARATUS FOR SORTING CONICAL BOBBIN TUBES

Arthur Würmli, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

PCT No. PCT/EP81/00187, § 371 Date Jul. 6, 1982, § 102(e) Date Jul. 6, 1982, PCT Pub. No. WO82/02186, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 2, 1981, Ser. No. 396,905

Claims priority, application Switzerland, Dec. 23, 1980, 9496/80

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—400 **10 Claims**

1. An apparatus for sorting substantially conical bobbin tubes, comprising:

transporting means including at least one substantially trough-shaped transporting pocket for receiving an individual substantially conical bobbin tube;

said at least one transporting pocket having a longitudinal dimension;

said at least one transporting pocket togehter with said substantially conical bobbin tube located therein being transportable by said transporting means in a predetermined transport direction which extends transversely relative to said longitudinal dimension of said at least one transporting pocket;

said at least one transporting pocket receiving therein said substantially conical bobbin tube which defines a longitudinal axis, a base end and a tip end, in either one of two opposite positions with respect to the location of the base end and the tip end of said substantially conical bobbin tube;

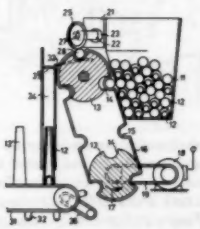
means for longitudinally displacing said substantially conical bobbin tube in said at least one transporting pocket in either one of two opposite directions depending upon the relative position of said base end and of said tip end of said substantially conical bobbin tube located in said at least one transporting pocket;

said longitudinal displacing means comprising:

two rolls each journaled in a related roller bearing for rotation about a related rotational axis;

a frame;

said frame being supported for pivotable movement about a pivot axis extending substantially parallel to said at least one transporting pocket;



said roller bearings being mounted at said frame and being substantially equally spaced from said pivot axis of said frame;

said two rolls being arranged such that said rotational axes thereof extend through an imaginary plane, which extends substantially at right angles to said at least one transporting pocket and divides the same into equal halves, on the same side of an imaginary straight line which interconnects said roller bearings;

said two rolls being arranged such that their rotational axes intersect said imaginary plane at a predetermined angle and extend at a further angle relative to said longitudinal axis of said substantially conical bobbin tube; and

said two rolls being displaceable towards said transporting means such that one of said two rolls bears upon said substantially conical bobbin tube placed in said at least one transporting pocket, while the other one of said two rolls stays out of contact therewith, in order to exert a transversely directed force on said substantially conical bobbin tube so as to laterally displace the same relative to said transport direction.

4,480,741

LEHR LOADER APPARATUS

Ricardo U. Chicurel, and Manuel G. Aguirre, both of Monterrey, Mexico, assignors to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Oct. 13, 1981, Ser. No. 310,849

Claims priority, application Mexico, Oct. 14, 1980, 184339

Int. Cl.³ B65G *47/32*

U.S. Cl. 198—430 **1 Claim**

1. Article transfer apparatus for pushing groups of articles from one conveyor to another where the conveyors are per-

pendicular to each other and in a common plane said apparatus comprising:

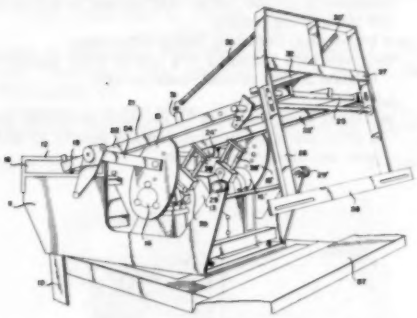
a stationary main frame adjacent to a first conveyor at a point where a second conveyor extends at right angles to and on the opposite sides of the first;

a movable frame mounted for horizontal sliding movement on said main frame transverse of the first conveyor, said movable frame being also capable of pivotal movement around a horizontal axis at that end of said movable frame remote from the first conveyor;

a first shaft rotatable on a first horizontal axis in said main frame;

cam means secured to said first shaft;

a link pivotally connected at its opposite ends to said cam means and said movable frame;



a second shaft rotatable on a second horizontal axis in said main frame parallel to but spaced from said first axis;

a first crank arm rigidly extending from said second shaft;

a second crank arm rigidly extending from said first shaft;

means slidingly and pivotally connecting said crank arms; and

means for rotatably driving said second shaft; whereby said movable frame for each revolution of said second shaft moves horizontally smoothly across the first conveyor at a first rate, pivots upwardly and returns to its starting position at a faster rate, such that the percentage of each operating cycle of the forward stroke of said frame is greater than that of the return stroke.

4,480,742

METHOD AND APPARATUS FOR CONVEYING AND SPREADING MATERIAL

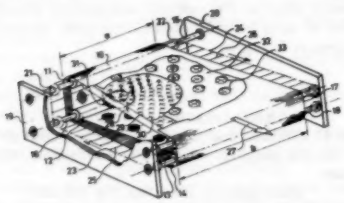
Wilfried E. Muylle, Schoten, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jun. 24, 1982, Ser. No. 391,671

Claims priority, application United Kingdom, Jul. 2, 1981, 8120443

Int. Cl.[3] **B65H** *35/02*; **B65G** *47/08, 17/02*

U.S. Cl. 198—689 **7 Claims**



1. A conveyor for conveying and spreading material placed thereon, said conveyor comprising an endless air-permeable continuous conveying band adapted to travel through an endless path having a generally horizontal upper conveying stretch, said band being elastically extensible in its widthwise direction; driving mechanisms for said elastic band disposed along the opposite side edges thereof and connected to said side edges, said driving mechanisms moving in paths diverging from one another in the direction of travel of said elastic band; means for moving said driving mechanisms along said paths so as to cause successive portions of the elastic conveying band moving along said converging stretch to be progressively widthwise stretched; endless air-permeable supporting band means of nonextensible material mounted for travel through an endless path contained within the endless path of said elastic conveying band and having an upper stretch parallel to, generally coextensive with, and in close proximity to the upper stretch of said elastic conveying band so that said band and band means are in face to face contact within said stretches; and disposed inside the endless path of said supporting band means a suction head having a substantially open upper end extending beneath the upper reach of said supporting band means in close proximity to the underside thereof, said suction head being at least substantially coextensive widthwise with said elastic conveying band; and a source of subatmospheric pressure in communication with said vacuum head to maintain a sub-atmospheric pressure within said head, whereby material carried on said elastic conveying band is exposed to the subatmospheric pressure in said head through the air-permeable band and band means and is thereby urged against the contiguous surface of the conveying band during its travel through said conveying stretch.

4,480,743

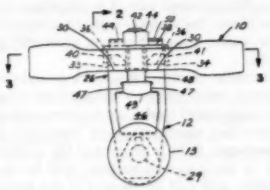
CONVEYOR CHAIN AND SUPPORTING BRACKET ASSEMBLY

Clarence A. Dehne, Farmington Hills, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Jan. 28, 1982, Ser. No. 343,391

Int. Cl.[3] **B65G** *39/20*

U.S. Cl. 198—845 **14 Claims**



1. A conveyor chain and supporting bracket assembly including a chain link having pairs of transversely spaced sides and longitudinally spaced ends defining an open central portion, and a chain supporting bracket adapted to travel on a track; wherein,

the supporting bracket is formed with an attachment end portion having transversely spaced first shoulders adapted to engage the sides of a first chain link and having second shoulders located outwardly of said first shoulders, said second shoulders being tranversely spaced a distance less than said first shoulders and being adapted to engage the sides of a second chain link of different size than said first chain link, said attachment end portion having a positioning portion projecting between said first and second shoulders into engageable relation with the sides of one of said first and second chain links within the open central portion thereof;

a clamp member engages the sides of said one chain link in opposed relation to one of said first and second shoulders;

fastening means is engageable with the supporting bracket and clamp member for clamping the sides of said one chain link therebetween, the fastening means extending

through the open central portion of said one chain link; and

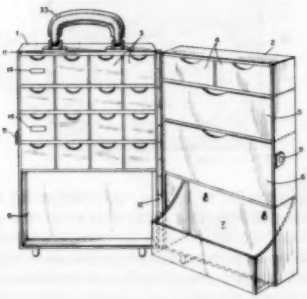
the clamp member is provided with a pair of longitudinally spaced lugs projecting into the open central portion of said one chain link in overlapping relation with the longitudinally spaced ends of the positioning portion of the supporting bracket.

4,480,744

MULTI-SECTIONED STORAGE CASE

Laura M. Blackmon, 420 San Saba, El Paso, Tex. 79912

Filed Dec. 7, 1982, Ser. No. 447,707
Int. Cl.³ B65D *3/04, 69/00*
U.S. Cl. 206—1.7 **12 Claims**



1. A case adapted to storage of small articles comprising:

(a) a first open faced, upright rectangular section and two other upright, open faced rectangular sections hinged thereto and constituting together a cover for said first section with the open face thereof facing the sections constituting said cover, one of said other two sections having a plurality of horizontally extending receptacles and each of said three sections being an open enclosure having a back and four sides to form a rectangular cavity;

(b) the other of said sections which constitutes a cover being divided into a plurality of removable compartments, one of which is slidably disposed within the cavity thereof but projects outward beyond said cavity a distance not greater than the depth of said first section.

(c) said first section having a vacant area therein opposed to said outwardly projecting compartment and adapted to receive the projecting portion of said compartment when said other section is closed over the first section as a cover; said first section being further provided with a plurality of removable compartments in areas other than said vacant area.

4,480,745

INTERLOCKING MODULAR DISPLAY RACK SYSTEM, COMPONENT UNITS THEREFOR, AND METHODS

David B. Loge, Cary, N.C.; William A. Cole, Wyncote, Pa., and Kevin J. Migdal, Raleigh, N.C., assignors to GoodMark Foods, Inc., Raleigh, N.C.

Filed Apr. 13, 1983, Ser. No. 484,684
Int. Cl.³ B65D *21/02*
U.S. Cl. 206—44 R **16 Claims**

1. A modular display rack system formed from a plurality of interlocked component units, said system being useful for the point-of-sale display of several different types of related consumer articles that are packaged in caddies according to article type and are sold individually at sales counters or like sales locations, the individual component units of said system comprising:

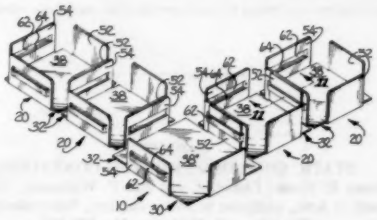
a base defining perimetric sides, said base having an upper support surface and an underside suitable for resting on a sales counter, or like surface;

a plurality of upstanding members extending upwardly from the perimetric sides of said base;

interior surfaces of said upstanding members being so configured as to define support and containment means for engaging the exterior of an upstanding consumer article caddy positioned on the base support surface and for holding the caddy such that the bottom of the caddy may be supported by the base support surface and such that the caddy may be held against lateral shifting by at least some upstanding members; and

the upstanding members of adjacent units defining cooperative, mating interlock means joining the units side to side by a sliding fit;

wherein said mating interlock means joining the component units together comprises each component unit having interlock means defined by said upstanding members on



the unit and comprising at least one male member at one of said base sides of the component unit and at least one female member at another one of said base sides, said male member being defined by one of said upstanding members comprising an upright tongue-like blade, and said female member comprising an upstanding member having an outwardly offset portion thereon defining a vertically oriented opening therein perpendicularly arranged with respect to the base, and being of a size so as to slideably receive therein the tongue-like blade male member of an adjacent component units to join the component units with each other in a horizontal side-by-side coplanar arrangement,

whereby a caddy containing a selected multiple number of consumer articles of a particular type may be held by each of the component units of said system to provide an orderly display of several types of related consumer articles in a desired array.

4,480,746

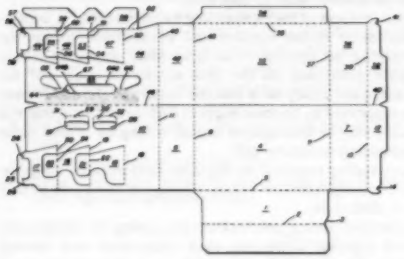
ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 3, 1984, Ser. No. 596,590
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—141 **7 Claims**

1. An article carrier comprising a bottom wall, a pair of side walls foldably joined respectively to the side edges of said bottom wall, end wall panels foldably joined respectively to the end edges of said side walls and extending inwardly therefrom, a medial partition panel foldably joined respectively at the ends thereof to the inner edges of the end wall panels on each side of the carrier and disposed in flat face contacting relation with each other and with their upper edges foldably joined together so as to form a double panel medial partition, adhesive means on the contacting faces of said medial partition panels to secure such panels together, elongated longitudinal aperture means formed in each of said medial partition panels the upper edges of which are disposed in general coincidence with each other, a reinforcing panel struck from the part of one of said medial partition panels which is disposed below and

adjacent the ends of the elongated longitudinal aperture means formed therein, said reinforcing panel being folded outwardly



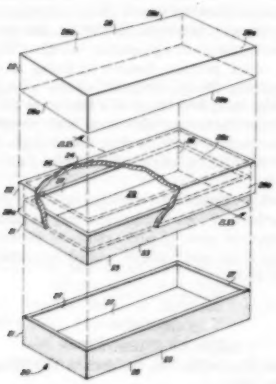
and upwardly into face contacting relation with said one medial partition panel, and adhesive means arranged to secure said reinforcing panel to said one medial partition panel.

4,480,747

STATIC SHIELDED SHIPPING CONTAINER

Thomas R. Kazor, Chandler, and Jon P. Whitcomb, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1983, Ser. No. 509,475
Int. Cl.³ B65D *81/14, 85/30*
U.S. Cl. 206—334 **4 Claims**



4. A two part handling, shipping, and storage container adapted to provide a conductive cage for electrostatically shielding objects placed therein, comprising:

a first part formed from a first dielectric material, open on one side, and having a first conductive surface coating only on an outward facing surface;

a second part formed from a second dielectric material, open on one side, and having a second conductive surface coating only on an inward facing surface;

wherein said first part is adapted to slideably engage said second part thereby forming said container; and

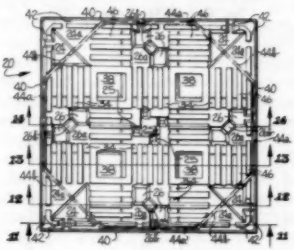
wherein, when said first part engages said second part, said first conductive surface coating contacts said second conductive surface coating, thereby enclosing objects placed within said container in said conductive cage formed from the combination of said first and second conductive surface coating.

4,480,748

SHIPPING PALLET AND CONTAINER

Joseph H. Wind, Taylors, S.C., assignor to Bigelow-Sanford, Inc., Greenville, S.C.

Continuation-in-part of Ser. No. 295,524, Aug. 24, 1981, Pat. No. 4,413,737, which is a continuation-in-part of Ser. No. 229,195, Jan. 28, 1981, abandoned. This application Oct. 13, 1982, Ser. No. 434,173
Int. Cl.³ B65D *19/00, 19/38, 21/02*
U.S. Cl. 206—386 **23 Claims**



1. A shipping pallet of unitary construction for use with another substantially identical pallet so as to serve as a bottom or top wall of a shipping container for transporting and storing a load, said shipping pallet comprising a base and a plurality of spaced-apart foot means projecting from a common side of said base, a first sleeve receiving groove provided adjacent the periphery of the pallet and on the side thereof opposite from said foot means, and a second sleeve receiving groove provided on the same side of the pallet as said first sleeve receiving groove and positioned so as not to extend outwardly beyond the confines of said first sleeve receiving groove and being so constructed and arragned as to be of different configuration than said first sleeve receiving groove so as to receive a sleeve therein of different cross-sectional configuration than that sleeve adapted to be received in said first sleeve receiving groove, wherein said first and second sleeve receiving grooves have coinciding linear portions and are concentrically arranged relative to each other and relative to the pallet and each encompasses at least a major portion of the pallet, and further wherein the grooves are of different overall size and geometric shape from each other.

4,480,749

TAMPER-EVIDENT CONTAINER AND METHOD FOR MAKING THE SAME

Peter K. Laucis, Lilburn, and Robert Terry, Norcross, both of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed May 26, 1983, Ser. No. 498,280
Int. Cl.³ B65D *85/56*
U.S. Cl. 206—459 **7 Claims**

1. A tamper-evident container comprising:

a container body defining opposite open ends, a plurality of integral flaps extending from each open end, said flaps

being sealed together with a thermoplastic material so as to close both open ends of the container; and

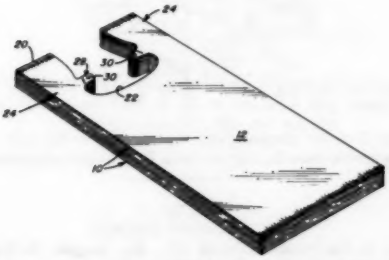
a temperature sensitive indicator being on the exterior surface of each closed end so that said indicator visually indicates whether an excessive amount of heat has been applied to the seal of thermoplastic material.

4,480,750

BAG CONSTRUCTION

H. Gordon Dancy, Middletown, Ohio, assignor to Sonoco Products Company, Hartsville, S.C.

Filed May 17, 1984, Ser. No. 611,250
Int. Cl.³ B65D *85/62, 30/00*
U.S. Cl. 206—554 **11 Claims**



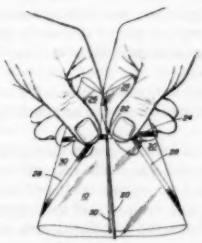
1. A bag construction comprising front and rear bag walls, a closed bottom, and a top portion, said top portion having a pair of laterally spaced handles, said handles including integral extensions of said front and rear bag walls, said front and rear bag walls, between said handles, defining an open bag mouth, each said handle extending above the bag mouth from a lower handle portion defining the lateral extent of said bag mouth to an upper handle portion defining a hand grip, and detachable tab means integral with each handle intermediate the upper and lower handle portions thereof and remote from said bag mouth.

4,480,751

APPARATUS FOR COLLECTING, STORING AND DISPENSING FROZEN BLOOD PLASMA

Richard M. Lueptow, Allston, Mass., assignor to Haemonetics Corporation, Braintree, Mass.

Continuation of Ser. No. 305,490, Sep. 25, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 567,137
Int. Cl.³ B65D *33/00*
U.S. Cl. 206—628 **17 Claims**



1. An "easy-open" container of flexible material comprising:

a body,

frangible seams extending longitudinally in the body and joined at an apex,

the seams having a finite width measured transversely of their longitudinal extension,

a closure seam of greater transverse width than the width of the frangible seams,

said closure seam sealing the body and intersecting the apex with the apex located within the closure seam intermediate its transverse width,

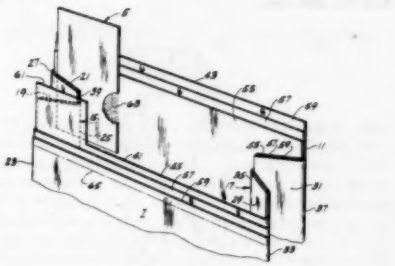
the container having means to direct manually applied force to the apex within the closure seam whereby the apex may be ruptured within the closure seam and the body torn to separate the body along the frangible seams.

4,480,752

PINCH CLOSURE BAGS WITH OPENING FEATURE AND METHOD OF MANUFACTURING THEM

Richard W. Jacobs, Eden Prairie, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.

Filed Aug. 9, 1982, Ser. No. 406,213
Int. Cl.³ B65D *3/26*
U.S. Cl. 206—632 **20 Claims**



1. A bag having a pinch closure at one end and a tab for opening it at said end, the bag being formed from a bag tube having first and second walls flat against one another, the second wall having an extension beyond the first at said end, the closure comprising a flap constituted by an end portion of the bag tube at said end folded over on a fold line spaced inwardly from the end edge of the first wall at said end, said flap thereby comprising the end portion of the first wall from the fold line to said end edge of the first wall and a portion of the second wall coextensive with said end portion of the first wall and said extension of the second wall, the tab having a section between said portions of the walls with an inner end adjacent the fold, a section underneath said extension, and an outer end section projecting out from under said extension, said flap being adhered to the outside face of the first wall and the outside face of the tab to seal the closure under the flap, the section of the tab underneath the extension being adhered to the outside face of the first wall to seal the closure under the tab, and the outer end section of the tab being free at least in part of the first wall to enable said outer end section of the tab to be grasped and pulled to tear the bag open by tearing away from the first wall of the portion of the flap adhered to the tab.

15. The method of making a bag with a pinch closure and means for opening the bag at the closure comprising providing a bag tube having first and second walls flat against one another with an extension of the second wall beyond the first wall at one end of the tube, opening up the tube at said one end, inserting a tab into the tube with the tab at its inner end between the walls and at its outer end extending out beyond the end edge of the extension of said one end and adhering the tab to said second wall, forming a pinch closure for the bag tube at said one end by folding over a flap constituted by an end portion of the tube at said one end on a fold line extending transversely of the bag tube spaced inwardly from the respective end edge of said first wall and adjacent the inner end of the tab, the tab being folded over with the flap, and adhering the flap to the outside face of the first wall and the outside face of the tab to seal the closure under the flap, and adhering the section of the tab underneath the extension to said first wall to

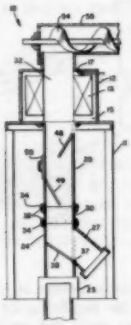
seal the closure under the tab, leaving the outer end section of the tab which extends out beyond the end edge of the extension free at least in part of said first wall to be grasped and pulled to tear the bag open by tearing away from the first wall of the portion of the flap adhered to the tab.

4,480,753

METAL DETECTOR APPARATUS AND METHOD

Joe P. Thomas, Tucker, Ga.; Charles D. Rogers, Springfield, Oreg.; Richard R. Noll; Harry E. Peltzer, both of Eugene, Oreg., and Steven P. Perrine, Cleves, Ohio, assignors to Metal Detectors, Inc., Eugene, Oreg.

Filed Jul. 12, 1979, Ser. No. 57,262
Int. Cl.³ B07C 5/344
U.S. Cl. 209—546 **7 Claims**



1. In a metal detector apparatus including an electromagnetic search coil disposed to detect metal in a material stream falling through said search coil and a reject means responsive to said search coil for cycling a gate from a standby position outside the path of said falling material stream to a reject position wherein said gate diverts said material stream from said path, and subsequently back to said standby position, the improvement comprising:

means for sensing the presence of said gate in said standby position; and

means, responsive to said gate being absent from said standby position longer than a predetermined period of time, for inducing said reject means to cycle said gate.

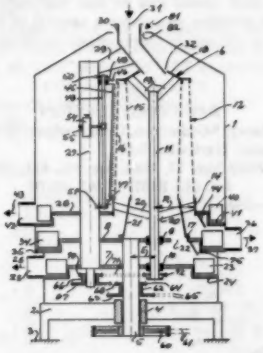
4,480,754

SCREENING APPARATUS FOR GRAINS, SEEDS OR THE LIKE CROPS

Ole Ewald, Odense, Denmark, assignor to DAMAS Maskinfabrik A/S, Faaborg, Denmark

Filed Dec. 8, 1982, Ser. No. 447,767
Claims priority, application Denmark, Dec. 14, 1981, 5543/81
Int. Cl.³ B07B 1/26
U.S. Cl. 209—683 **10 Claims**

1. Screening apparatus for grains, seeds or the like crops comprising a housing having a main axis and a planetary axis eccentrically located with respect to the main axis, said housing containing a support structure which is adapted to be rotated about the main axis and which supports screening means adapted to be rotated about the planetary axis, the support structure having vane means which, during the rotation of the support structure, move in a delivery channel for the screened goods which is formed in the housing, the eccentricity E of the planetary axis with respect to the main axis being smaller than the longest radius R of the screening means.

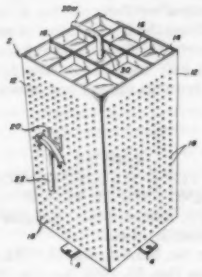


4,480,755

TOOL STORAGE DEVICE

Jerry G. Cartwright, Ellwood City, Pa., assignor to Wesco Manufacturing, Inc., Aurora, Ill.

Filed Sep. 13, 1982, Ser. No. 417,600
Int. Cl.³ A47F 7/00
U.S. Cl. 211—60 T **6 Claims**



1. A tool storage device, comprising

(a) a cabinet having a generally rectangular horizontal cross-sectional configuration, said cabinet including a plurality of vertically arranged planar side walls each containing a plurality of apertures each adapted to receive a portion of a support hook;

(b) means arranged within said cabinet for locking said hook portions within said apertures, said locking means including

(1) a plurality of locking plates arranged parallel to and spaced from said side walls, respectively;

(2) spring means connected with said locking plates for normally biasing each of said locking plates in a direction away from the associated side wall toward unlocked positions in which said locking plates release said hook portions, respectively; and

(3) means for displacing said locking plates relative to said cabinet side walls between the unlocked positions and locked positions in which said locking plates press said hook portions against the inner surfaces of the associated side walls, respectively, said displacement means including horizontally arranged cam means including a

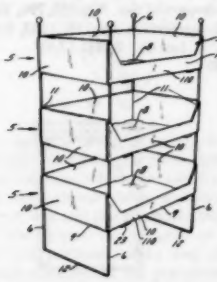
plurality of projections, at least one of said cam projections being adapted for operable engagement with each of said locking plates against the biasing force of said spring means, respectively, said cam means being rotatable about the vertical axis of said cabinet, whereby when said locking plates are in the unlocked positions, a plurality of support hooks may be arranged at desired locations on the outer surfaces of said side walls by passing said hook portions through said side wall apertures, and subsequently when said cam means are rotated to displace said locking plates to the locked positions, said support hooks are fixed in the selected locations on the cabinet side wall surfaces to support tools, materials, and the like.

4,480,756

DISPLAY RACK FOR LIGHTWEIGHT MERCHANDISE

Paul Belokin, Jr., Route 4, Box D, Hayward, Wis. 54843

Filed Feb. 24, 1983, Ser. No. 469,259
Int. Cl.³ A47F 5/11
U.S. Cl. 211—126 **4 Claims**



1. A display rack comprising a tray formed of one piece of a stiff but foldable material such as kraftboard, having a bottom wall with straight side edges and having a plurality of upright side walls that project up from said side edges and meet one another at corners, and supporting means whereby said tray is held with its bottom wall elevated, said display rack being characterized by:

A. said supporting means comprising a plurality of upright rods, one for each of said corners;

B. said tray having each of its side walls formed with two flatwise superimposed layers of material,

(1) an outer one of said layers being connected to said bottom wall around a bend line along one of said side edges and

(2) the inner one of said layers being connected to the outer layer around a fold line along the top edge of the side wall;

C. said tray further having, at each of said corners, a flap which extends from the outer layer of one of the pair of side walls at the corner and which is bent around the corner and is flatwise confined between the layers of the other side wall of the pair;

D. the rod at each of said corners being confined against lateral displacement relative to the tray by

(1) being received in the bend of the flap at the corner, and

(2) being retained in said bend by the inner layers of the pair of side walls that meet at the corner, each of which inner layers has a portion extending along an upright end edge thereof that engages the rod; and

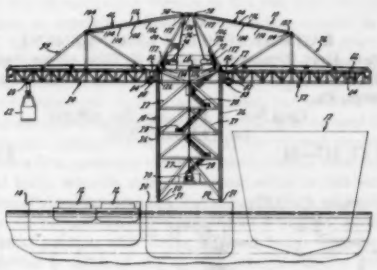
E. each rod having an upwardly facing abutment which is spaced above its bottom end and which supportingly engages the tray.

4,480,757

COLLAPSIBLE FRAME SUPPORT FOR PIVOTAL BOOM ON A PORTABLE CRANE

Maynard A. Oustad, Duluth, Minn., assignor to AMCA International Corporation, Hanover, N.H.

Filed Jan. 28, 1982, Ser. No. 343,717
Int. Cl.³ B66C 7/00, 23/42, 23/52; B63B 35/30
U.S. Cl. 212—257 **2 Claims**



1. In an apparatus including a transport vehicle and a crane structure mounted on said transport vehicle, said crane structure including a gantry structure and a generally vertical tower structure, said gantry structure including two boom portions and trolley tracks thereon, said boom portions further being pivotally attached to and supported by said generally vertical tower structure and extending outwardly therefrom in opposite directions and selectively alignable with said trolley tracks, substantially at an upper end thereof, and said crane structure further including an upper supporting structure attached to said generally vertical tower structure substantially at said upper end thereof and protruding generally upwardly relative to said tower structure and said boom portions, the improvement comprising pivot means for selectively pivoting said boom portions relative to said vertical tower structure between respective operating positions wherein said boom portions protrude generally horizontally from said vertical tower structure substantially at said upper end thereof and respective rest positions wherein said boom portions are lower than the top of said vertical tower structure, at least one link assembly distinct from said pivot means disconnectibly interconnecting each of said boom portions with said upper supporting structure for supporting said boom portions in said respective operating positions, said link assemblies each including a number of link members disconnectibly connected to one another, at least a pair of adjacent link members in each of said link assemblies being selectively disconnectible from one another in order to disconnect said boom portions from said upper supporting structures and to allow said pivoting of said boom portions to said respective rest positions lower than the top of said vertical tower structure, power means for pivoting said boom portions including actuators means selectively interconnecting said upper supporting structure and said tower structure for selectively collapsing said upper support structure in order to selectively reduce the overall height of said crane structure to allow said transport vehicle to pass under overhead obstructions, said upper support structure including an A-frame structure pivotally and collapsibly attached to the top of said vertical tower structure said A-frame structure being collapsible when said boom portions are in said respective rest positions, said pivot means including upper and lower hinge assemblies pivotally and selectively disconnectibly interconnecting each of said boom portions with said vertical tower structure, and separate upper and lower means for selectively disconnecting each of said upper and lower hinge assemblies, respectively, said upper hinge assemblies pivotally interconnecting said boom portions to said vertical tower structure for upward pivotal movement from said respective operating positions and relative to said vertical tower structure when said lower hinge assemblies are

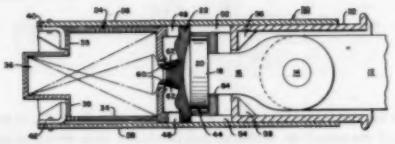
disconnected, and said lower hinge assembly pivotaly interconnecting said boom portions to said vertical tower structure for downward pivotal movement from said respective operating positions and relative to said vertical tower structure when said lower hinge assemblies are disconnected, said link members being disconnectible from one another when the respective boom portions are pivotally moved upwardly relative to said vertical tower structure.

4,480,758

RAILWAY COUPLER ARRANGEMENT

Alvin G. Hurt, Pittsburgh, and Lynn K. Tilly, Allison Park, both of Pa., assignors to McConway & Torley Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1982, Ser. No. 438,581
Int. Cl.³ B61G *7/10*
U.S. Cl. 213—54 **5 Claims**



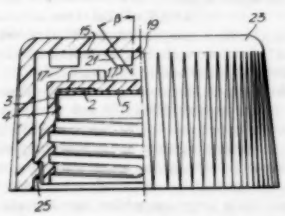
1. A railway coupler arrangement comprising a center sill, front and rear draft lugs within the sill, a draft gear housing having forward and aft wall means, said draft gear housing being carried within the sill and slideable between the front and rear draft lugs, a draft gear within the draft gear housing, a follower and plunger block slideable in said draft gear housing and in engagment with one end of the draft gear, a coupler yoke shank extending into said draft gear housing, a butt on said shank engageable with said follower and plunger block within the draft gear housing and movable from a position where it engages said forward wall means on the draft gear housing during draft loads to a position removed from the forward wall means where it forces the follower and plunger block into the draft gear during buff loads, the aft wall means of the draft gear housing engaging said rear draft lugs during buff loads, and means associated with said front draft lugs for engaging said follower and plunger block during draft loads to compress said draft gear.

4,480,759

CHILD-PROOF CLOSURE

Rainer Behrens, Hamburg; Dieter Peissl, Norderstedt Bei Hamburg; Jürgen Schondelmayer, Kempten, and Ulrich Brach, Zell-Mosel, all of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 4, 1982, Ser. No. 405,011
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 8122918[U]
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—220 **3 Claims**



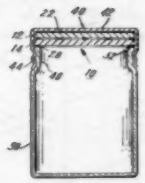
1. Child-proof turn-lock closure of plastic material for threaded mouths on containers, particularly on bottles, with a screw cap closure on which an outside cap is clamped with axial play, both of which caps are provided with projections or projections and grooves which, within the axial play, can engage in each other, those sides of the projections or grooves which touch each other when the cap is screwed down being made as carriers, while those sides of the projections or grooves which touch each other when the cap is screwed off act as wedges, and in such a way that, when being screwed down, the screw cap is carried by the outside cap but when being screwed off this only happens when an axial pressure is exerted on the outside cap and directed against the container, characterized in that recesses (2) are provided in the face of the screw cap, which are covered by a gas- and liquid-impermeable inlay cover (5).

4,480,760

TAMPER VISIBLE INDICATOR FOR CONTAINER LID

Milton Schonberger, 1 Century Tower, Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 451,794, Dec. 21, 1982, abandoned. This application Apr. 13, 1983, Ser. No. 484,636
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—230 **52 Claims**



1. A container lid insert for indicating that a container lid has been removed from the opening into a container, the lid insert comprising:

an upper disc-like element and a lower disc-like element; each element having a respective upper and lower surface; the lower surface of the upper element being superposed over the upper surface of the lower element; first securement means for securing the upper and lower elements superposed;

second securement means at the upper surface of the upper element for securing the upper element in the container lid; third securement means at the lower surface of the lower element and positioned for engaging the container around the opening which is covered by the lid and for securing the lower element to the container there;

the second and third securement means being adapted to exert greater securing force on the lid and container, respectively, than the first securement means is adapted to exert between the upper and lower elements, whereby with the upper element secured to the lid at the second securement means and the lower element secured to the container at the third securement means, upon separation of the lid from the container upon which the lid is positioned, the first securement means is adapted to permit the upper and lower elements to become separated at the superposed surfaces thereof;

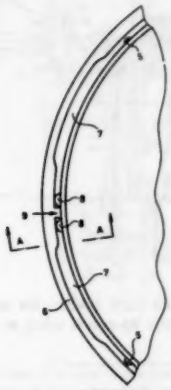
indication means adapted to respond to the separation of the upper and lower elements and the indication means being located between the upper and lower elements and being adapted to provide its indication upon the separation of the upper and lower elements.

4,480,761

TAMPER INDICATING CLOSURE FOR A CONTAINER

Dietmar Aichinger, Runenberg, Switzerland, assignor to Albert Obrist AG, Reinach, Switzerland

Filed Jul. 14, 1983, Ser. No. 513,909
Claims priority, application Switzerland, Jul. 14, 1982, 4280/82
Int. Cl.³ B65D 41/34
U.S. Cl. 215—252 6 Claims



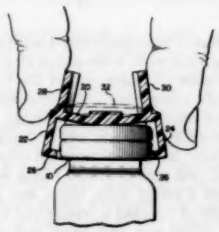
1. A closure cap for a container, which is provided with a guarantee strip that can be brought into engagement with the neck of the container, and which is made in one piece with the guarantee strip from thermoplastic material by an injection moulding process, wherein the guarantee strip is joined to the lower edge of the closure cap by way of a multiplicity of desired-rupture web portions and by way of a reinforced region and the wall thickness of the guarantee strip has a reinforcement in the area between each two desired-rupture web portions, characterised in that the reinforced region comprises two substantially vertically extending holding web portions (8) and that the guarantee strip is interrupted between the holding web portions.

4,480,762

REUSEABLE VIAL CAP

Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.

Filed Jun. 11, 1982, Ser. No. 387,345
Int. Cl.³ B65D 45/00
U.S. Cl. 215—273 2 Claims



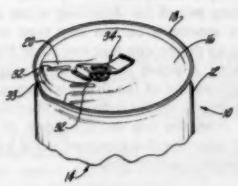
1. A reuseable cap for sealing a vial having a neck portion; said cap comprising a body of resilient material having a base for overlying the open end of a vial neck portion, a pair of opposed jaws formed integral with said body and of said resilient material, said pair of jaws projecting from said base in a first direction to extend along said neck portion in radially outward overlying gripping relation with said neck portion, a pair of discrete opposed gripper flanges formed integral with said body and of said resilient material, each said gripper flange projecting in a direction opposite to said first direction, said gripper flanges being diametrically opposed to define an area therebetween, and each being aligned with one of said jaws, such that said gripper flanges may be manually gripped and flexed toward each other thereby to flex said base and spread said jaws in opposition to the resilient forces created in said flexed base tending to bias said jaws toward each other and into engagement with the vial neck portion, and a locking bar member disposed between said gripper flanges and oriented generally transverse thereto, said locking bar member being formed integral with said body and including an integral hinge joining said locking bar to said body for pivotal movement between a first, generally vertical locked position with respect to said body, wherein said locking bar when in said vertical position is disposed between and engaged with said gripper flanges to prevent flexing thereof, and a second, generally horizontal position with respect to said body, wherein said locking bar is disposed out of engagement with the gripper flanges, such that said gripper flanges may be flexed toward each other to spread said jaws preparatory to disengaging said cap from a vial.

4,480,763

BEVERAGE CONTAINER OPENING MEANS

Fritz N. Schneider, 22030 Madison St., Dearborn, Mich. 48124

Filed Sep. 30, 1982, Ser. No. 431,820
Int. Cl.³ B65D 17/34
U.S. Cl. 220—269 9 Claims



1. A beverage container comprising:

a main body having a top, said main body defining an interior chamber in which a beverage is contained, said top having a portion surrounded by a score;

a tab;

means for securing a midpoint of said tab to said top wall so that one end of said tab registers with said scored portion while the other end of said tab extends outwardly from said scored portion, said other end of said tab being spaced from the top wall by a distance sufficient to allow at least a portion of a finger of a normal adult to be positioned between said other end of said tab and said top;

whereby said other end of said tab is easily grasped and pulled outwardly from said top wall whereupon said one end of said tab punches said scored portion into the interior of said can; and

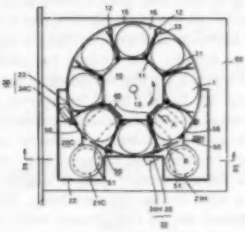
wherein said main body comprises an outwardly extending rim formed around the outer periphery of said top wall, said top comprising an inclined surface which slopes upwardly from a midpoint of said top and towards said rim, an outer end of said inclined section terminating closely adjacent said rim and wherein said scored portion is formed on said inclined surface.

4,480,764

DRINKING CUP STORAGE AND FEEDING DEVICE FOR AN AUTOMATIC VENDING MACHINE

Toshio Takagi, Kuwana; Masao Iwanami, Suzuka, and Teruaki Sumikawa, Yokkaichi, all of Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Feb. 14, 1983, Ser. No. 466,292
Claims priority, application Japan, Feb. 18, 1982, 57-24931
Int. Cl.³ G07F *11/12*
U.S. Cl. 221—11 **5 Claims**



1. A drinking cup storage and feeding device for an automatic vending machine comprising:

a rotary type cup storage drum having on its periphery a plurality of cup storage chambers for receiving at least two different kinds of drinking cups stacked in columns;

a cup take-out stage having at least two classified-by-kind cup take-out mechanisms spaced apart from each other and positioned adjacent to, but outside the rotational movement of the cup storage drum, for supplying specific cups one by one to a vending stage according to a selection signal;

means for sensing when a cup take-out stage becomes empty of cups, and for rotating the cup storage drum in response to said empty condition;

cup selecting means for detecting when a full cup storage chamber storing a certain cup type reaches a position adjacent an empty cup take-out stage for the same type of cup during rotation of the cup storage drum, and for stopping rotation of the drum in response thereto; and

cup delivering means for delivering the full stored cup group column from the cup storage drum to the adjacent cup take-out stage for that cup type while keeping the column in an upright stacked posture.

4,480,765

NEEDLE SEEDER

Egidio L. Tonus, 10904 Oak St., Castroville, Calif. 95012

Filed Dec. 13, 1982, Ser. No. 449,351
Int. Cl.³ B65H *3/08*
U.S. Cl. 221—211 **2 Claims**

1. A seed delivery system, comprising:

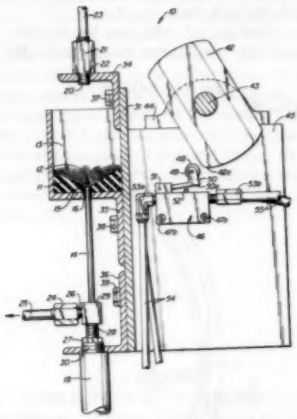
trough means for containing a seed bed;

a plurality of spaced, hollow, substantially vertical seed needles, provided as a matrix of seed needles, arranged in rows and columns, each seed needle having a tip portion and projecting upwardly, along a needle axis through an opening in a bottom portion of said trough means and into said seed bed, the tip portion of each said needle including an inner recess;

a seed delivery port associated with each seed needle;

means for maintaining a negative pressure on each needle tip when said tip is at said seed bed and when said tip is moved between said seed bed and its associated seed delivery port, and for maintaining a positive pressure on each needle tip when said tip at its associated seed delivery port;

means effecting coordinated reciprocal needle movement along said needle axes between said seed bed wherein an individual seed is picked up and cradled in each seed tip recess, and said associated seed port; and



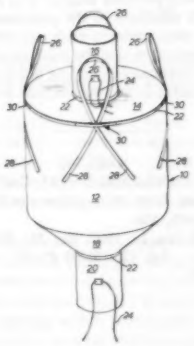
means, associated with each needle, for discharging said seed from said needle tip recess when at said associated delivery port.

4,480,766

BULK TRANSPORT BAG

Nigel D. Platt, Melton Constable, England, assignor to IBC Transport Containers, Ltd., East Molesey, England

Filed Sep. 24, 1982, Ser. No. 422,392
Int. Cl.³ B65D *33/14, 33/28*
U.S. Cl. 222—105 **14 Claims**



1. A bulk transport bag comprising a main materials-containing body having a side wall, a top wall with a closable inlet and a bottom wall with a closable outlet for the material to be carried, the body comprising a fabric coated with a plastic material, lifting means attached to said body, the lifting means comprising a plurality of fabric webs coated and/or impregnated with a plastic material compatible with the plastic coating of the body, said plastic treated lifting webs each having, on both sides of a lifting loop, linear end portions through which the weight of the load is transferred to the lifting loops from the body of the bag, said linear end portions being secured to the side wall of the plastic coated body by the bonding together of said compatible plastic materials by a weld, and each of said linear end portions, where it separates from the side wall of the bag to start the lifting loop, being retained close to the body by an anti-peel device of fabric coated with a

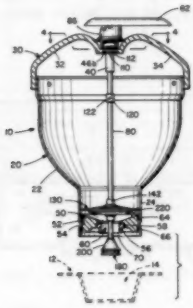
compatible plastic material which is bonded to the plastic coating of the body whereby said load transfer occurs without detachment of the lifting webs.

4,480,767

APPORTIONING AND DISPENSING APPARATUS

Amos J. Brown, Bothell, Wash., assignor to Belshaw Bros., Inc., Seattle, Wash.

Filed Mar. 1, 1982, Ser. No. 353,784
Int. Cl.³ A21C *11/18*; G01F *11/02*
U.S. Cl. 222—340 **2 Claims**



1. In an apparatus of a type comprising

(a) a hopper, which has a bowl adapted to hold dough, and which has a throat opening downwardly from the bowl and having an upper portion and a lower portion,

(b) an annulus, which is mounted coaxially and integrally in the lower portion of the throat, and which has a cylindrical outlet opening from the bowl and having a lower, circumferential cutting edge,

(c) a rod which is reciprocatable coaxially in the hopper between an upper position and a lower position, which has a lower portion extending through the outlet, and which has a lower end extending downwardly past the cutting edge of the outlet when the rod is positioned in the lower position but not past the cutting edge of the outlet when the rod is positioned in the upper position,

(d) means to move the rod downwardly and upwardly so as to reciprocate the rod between the upper and lower positions,

(e) a valve stop, which is mounted integrally to the lower portion of the rod so as to extend radially from the rod, and so as to be spaced from the lower end of the rod,

(f) a valve plate, which is mounted coaxially and integrally to the lower portion of the rod, above and in spaced relation to the stop, so as to reciprocate within the upper portion of the throat, which has an aperture enabling dough from the bowl to flow downwardly through the plate, and which is shaped so as to close the throat except for the aperture,

(g) a valve disc, which is mounted coaxially and slidably on the lower portion of the rod, between the plate and the stop, and which is shaped so as to block the aperture when the disc is positioned against the plate, and

(b) a cylindrical piston, which is slidable axially in the outlet, which is mounted integrally and coaxially to the lower end of the rod so as to be drawn upwardly into the outlet when the rod is moved to the upper position, and so as to be spaced below the outlet when the rod is positioned in the lower position, which is shaped so as to plug the outlet when the rod is positioned in the upper position, and which has an upper, circumferential cutting edge,

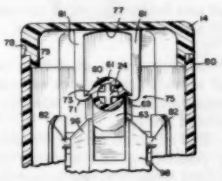
whereby dough enters the throat from the bowl through the aperture in the plate and flows around and beneath the disc as the rod is impelled upwardly from the lower position to the upper position, whereby dough is dispensed from the throat through the outlet as the rod is moved downwardly from the upper position to the lower position, and whereby dough dispensed through the outlet is cut off, by the cutting edges, as the rod is moved upwardly from the lower position to the upper position so as to draw the piston upwardly into the outlet, an improvement wherein the piston has an upper, integral, coaxial boss, which has a convex, frusto-conical surface extending upwardly and being spaced from the upper, circumferential cutting edge of the piston, and wherein the annulus has a concave, frusto-conical surface, which flares upwardly, whereby the apparatus can be used to dispense batter as well as dough, whereby batter tends to flow downwardly along the frusto-conical surfaces so as not to splatter on the piston even if thin, and so as not to accumulate on the annulus or on the piston even if mixed with raisins, shredded coconut, nut meats, frozen berries, or large particulates of other types, and whereby such particulates, if caught between the piston and the outlet, tend not to be crushed but to be deflected by the convex, frusto-conical surface of the piston or cut cleanly, by the cutting edges, as the piston is drawn into the outlet.

4,480,768

HAND-OPERATED PUMP

Douglas S. Martin, Lawrenceville, Ga., assignor to Universal Dispensing Systems, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 395,685, Jul. 6, 1982,. This application Sep. 27, 1982, Ser. No. 423,623
Int. Cl.³ B65D *47/34*
U.S. Cl. 222—341 **6 Claims**



1. A dispensing apparatus comprising a body portion including a variable volume pump chamber, a forwardly directed outlet conduit from the pump chamber, and a peripheral side wall spaced laterally from the outlet conduit having an upper edge defining a top opening,

a top having a depending peripheral flange situated inside the upper edge defining the top opening and a pair of longitudinally extending tabs depending from the top to straddle the outlet conduit, and

locking means for locking the top to the body portion, the locking means including a longitudinally extending lateral flange on each side of the outlet conduit and engaging means on the pair of longitudinally extending tabs for engaging the lateral flanges.

4,480,769

RE-USABLE CONTROLLED OUTFLOW AND LIQUID-TIGHT PLUG FOR BOTTLES AND THE LIKE

Antonio Tellini, Via Salvotti 22, Villanova di Guidonia, Rome, Italy

Filed Jun. 14, 1982, Ser. No. 388,410
Int. Cl.³ B65D *47/00*
U.S. Cl. 222—519 **18 Claims**

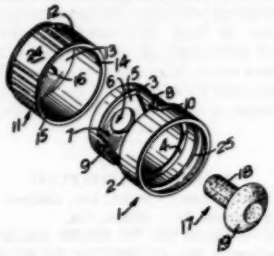
1. A re-usable controlled outflow and liquid-tight plug for bottles and the like, said plug comprising:

a fixed element having a hollow cylindrical body adapted to be secured on a neck portion of the bottle over the mouth of the bottle, an outflow opening provided in the perimetrical wall of said cylindrical body for flow communication with both the hollow interior thereof and the bottle mouth;

a movable element having a hollow cylindrical body to receive an upper portion of said fixed element concentrically therein in a telescopic relationship, said movable element including a top wall for closing its upper end;

engaging means for integrally joining said movable element to said fixed element and for permitting said movable element to vertically slide on said fixed element when said movable element is disposed over said fixed element, said movable element being manually slidably moved between a first raised position uncovering said outflow opening of said fixed element to define an opened condition, and a second lowered position covering said outflow opening of said fixed element to define a closed condition;

said engaging means including a vertical groove disposed on



each vertical side of said outflow opening of said fixed element, and a pair of diametrically opposed pins being provided within a lower portion of said movable element, each of said pins being engaged in an associated one of the grooves for sliding movement therein;

and

a sealing member secured to an interior surface of said top wall of said movable element for movement therewith to seal the bottle mouth when said movable element is in said second lowered position;

whereby the flow of liquid from the bottle is controlled by selectively positioning said movable element vertically along said fixed element between said first raised position and said second lowered position to regulate outflow size of said outflow opening of said fixed element.

4,480,770

METHOD AND APPARATUS FOR THE PROTECTION OF MOLTEN METAL FLOWS IN FURNACES

Albert-Gilbert Goursat, Elancourt-Maurepas; Thierry Hersant, Chatou, and Jacques Nicolas, Paris, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 19, 1981, Ser. No. 294,323

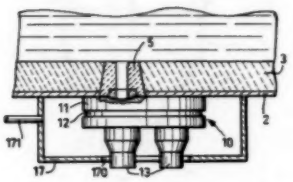
Claims priority, application France, Sep. 15, 1980, 80 19837

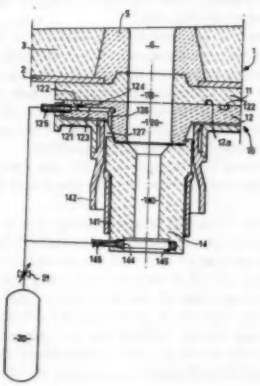
Int. Cl.³ B22D *41/00, 41/08*

U.S. Cl. 222—590 **6 Claims**

1. A method for protecting a teeming or stream or flow of a molten metal contained in a vessel and passing through a plate-type cut-off device of the kind comprising a stationary plate with an outlet opening therethrough and a displaceable plate that is connected to at least one nozzle at an outlet opening through said displaceable plate, said molten metal passing through said two outlet openings and said nozzle, which method comprises the steps of feeding a gas which is substantially inert with respect to the metal being teemed and has a pressure at least slightly higher than atmospheric pressure between said plates, distributing the gas around the metal while the latter passes through the device, said gas isolating the metal from ambient air by forming a protective gaseous barrier, isolating substantially the whole device by enclosure means including a housing, and supplying said inert gas under pressure to a gas intake port on said housing so that the space between said device and said enclosure means is supplied with said inert gas at a pressure at least slightly higher than atmospheric pressure and said inert gas exits from said enclosure means at said at least one nozzle to form an inert gas shield around said molten metal.

4. A plate-type cut-off device for cutting off the flow of molten metal from the outlet of a vessel, said device comprising a stationary plate and a displaceable plate provided with at least one nozzle, said plates and said nozzle each having at least one opening in communication with said outlet, respective surfaces of said plates being mutually juxtaposed and having at least a small play between said surfaces susceptible to leakage of gas thereat, gas intake and distribution means including a source of a gas which is substantially inert with respect to the molten metal and has a pressure at least slightly higher than atmospheric pressure, said distribution means including a re-





cess constituted by a groove formed in said surface of said displaceable plate and surrounding said at least one opening in said plate in communication with said outlet, said groove being connectable to said source of inert gas via at least one internal passage formed within said displaceable plate, such that said distribution means surrounds the molten metal flowing through said device to establish a gaseous protective barrier between said flowing metal and the ambient air, said distribution means further including conduit means coupled to said at least one internal passage formed within said displaceable plate and connecting to the area of connection between said displaceable plate and said nozzle for distributing said inert gas to said area.

4,480,771

ROTARY NOZZLE SYSTEM FOR METALLURGICAL VESSELS

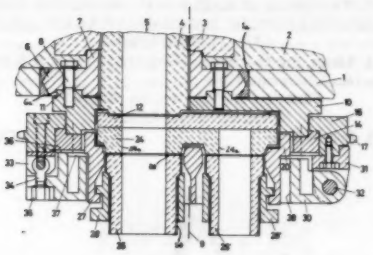
Ernst Meier, Wollerau, Switzerland, assignor to Stopinc AG, Baar, Switzerland

Filed May 12, 1980, Ser. No. 148,594

Claims priority, application Switzerland, May 25, 1979, 4891/79

Int. Cl.³ B22D *41/08*

U.S. Cl. 222—598 36 Claims



20. A rotary nozzle system for metallurgical vessels: comprising:

a fixed bottom plate;

a slide plate coacting with said fixed bottom plate;

rotatable closure means containing therein said slide plate;

a pressure plate cooperating with said slide plate and arranged within said rotatable closure means;

said rotatable closure means comprising:

a rotatable drive portion for rotating said pressure plate;

a cover member displaceably mounted at said rotatable drive portion; and

hinge means for pivotably connecting said cover member with said rotatable drive portion.

4,480,772

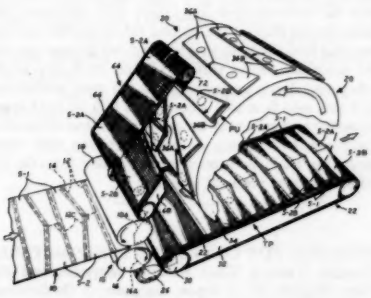
SLEEVE MAKING METHOD AND APPARATUS

Robert J. Gerndt, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 4, 1983, Ser. No. 463,783

Int. Cl.³ A41H *43/02*

U.S. Cl. 223—1 13 Claims



1. In a method for manufacturing garment sleeves from continuous webs of material, the steps of:

providing continuous webs of material including seams forming pairs of left and right sleeves in a pattern alternating between cuff-to-cuff and shoulder-to-shoulder relation in said webs;

cutting said continuous webs to sever said pairs of sleeves;

separating successive severed pairs of cuff-to-cuff sleeves from said webs and turning each sleeve end for end to rearrange said cuff-to-cuff pairs of sleeves into shoulder-to-shoulder relation;

separating successive shoulder-to-shoulder pairs of sleeves from said webs and conveying said separated shoulder-to-shoulder pairs of sleeves in spaced relationship; and

transferring successive rearranged pairs of sleeves and placing each transferred pair in the space between and overlapping successive shoulder-to-shoulder pairs with the cuffs of the sleeves in alignment.

4,480,773

HOLDING DEVICE FOR MOTORCYCLES

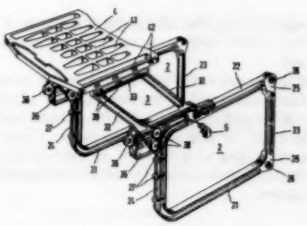
Michael Krauser, Germering, Fed. Rep. of Germany, assignor to Krauser Kraftfahrzeug-Zubehoer Vertriebs GmbH, Mering, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,821

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211308

Int. Cl.³ B62J *7/04*

U.S. Cl. 224—32 A 8 Claims



1. A holding device for use with a motorcycle to support saddlebags, baggage pieces, blinkers, reflectors, and the like, comprising two lateral holding frames, each defining a top side and a rear side; two upper frames each being attached by transverse fastening screws to the top side of an assigned holding frame in such a manner that after loosening said fastening screws said upper frames being displaceable backwards when viewed in the driving direction; a transverse rack mounted on said upper frames; an end part of each top side of the holding frame adjoining the rear side thereof being provided with guiding means in the form of two grooves formed in the lateral wall of said top side for slidable engaging the loosened fastening screws, each of said grooves having a straight portion for guiding said screws and thus said upper frames in horizontal direction, and a bent-portion for tilting said upper frames about 90° downwardly.

4,480,774

CROSSBOW CARRYING CASE

James G. Smith, 1431 New St., Union Grove, Wis. 53182, and Lawrence J. Ojstrsek, 1674 Highway 175, Hubertus, Wis. 53033

Filed Jan. 31, 1983, Ser. No. 462,606

Int. Cl.³ A45C *13/26, 13/36;* B65D *85/00*

U.S. Cl. 224—205 14 Claims

1. A carrying case for an assembled crossbow having a stock, said case comprising

opposed base and cover sections having a generally triangular shape, an end edge portion and a pair of side edge portions diverging toward said end edge portion and each having opposite ends, a first end joining said end edge portion and a second end joining said second end of the other side edge portion;

means interconnecting said base and cover sections along one of said edge portions to permit movement of said cover section relative to said base section between a

closed position wherein said base and cover sections are in facing relationship and cooperate to define a compartment for receiving an assembled crossbow and an open position wherein said cover section is moved away from said base section to permit access to the crossbow;

retainer means for releaseably securing the crossbow with the stock in an upright position to said base section inside said compartment;

fastener means for releasably fastening said base and cover

sections together along the other two of said edge portions when said cover section is in the closed positions; and

a strip of wear resistant material on the inner surface of said base section and on the inner surface of said cover section and extending longitudinally substantially between the juncture of said side edge portions and said end edge portion and at a location corresponding to that of the crossbow stock when the crossbow is secured on said base section.

4,480,775

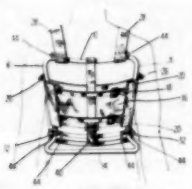
FRONT PACK

Lamarr O. Stanford, 1500 Merivale Rd., Ottawa, Ontario, Canada K2C 3G6

Filed Sep. 30, 1982, Ser. No. 431,244

Int. Cl.³ A45F *3/10*

U.S. Cl. 224—210 **10 Claims**



1. A pack adapted to be worn on the front of a wearer to support an upwardly open container to which ready access by the wearer must be had, said pack comprising:

a frame to which the container is to be secured and comprising:

an upright portion including a pair of generally vertical standards and upper and lower bar means interconnecting said standards, and

a forwardly projecting portion including a support bar projecting forwardly from said upright portion adjacent said lower bar means for supporting the bottom of the container from beneath,

a cinch adapted to be worn about the waist of the wearer and including a padded front portion,

said cinch and said frame carrying releasable connecting means for supporting said frame such that said upper bar means is situated above the wearer's stomach and below the wearer's shoulders, and said lower bar means is situated at the wearer's waist in front of said padded front portion of said cinch, and said support bar is disposed at about the wearer's waist,

securing means for securing said frame on the front of the wearer's torso and including:

first strap means securable to said frame and extendable around the upper back of the wearer, and

second strap means securable to said frame and extending over at least one shoulder of the wearer.

4,480,776

THUMB BREAK HOLSTER HAVING MEANS FOR PREVENTING FORCIBLE WITHDRAWAL OF A HAND GUN THEREFROM

John H. Atkins, Sr., Cincinnati, Ohio, assignor to A & B Industries, Inc., Cincinnati, Ohio

Filed Sep. 9, 1983, Ser. No. 530,543

Int. Cl.³ F41C *33/02*

U.S. Cl. 224—243 **9 Claims**

1. A holster for holding a hand gun comprising:

a first panel having a peripheral margin, the upper end of said panel being wider than the lower portion of said panel, the upper forward portion of said panel forming an upwardly extending tab including fastening means disposed on the inner surface of said tab;

a second panel of substantially the same shape and size as said first panel, said panels being joined along their lower and rear margins, said second panel including an upwardly extending second tab overlying said first mentioned tab, the upper edge of said second tab terminating in a latch flap having a length less than the length of said second tab, said flap being joined to said second tab such that it folds inwardly and downwardly against the inner surface of said second tab, said flap being positioned so that the hammer spur associated with the hand gun fits between the flap on the second tab when the hand gun is inserted into the holster, and fastening means disposed on the inwardly facing surface of said latch flap such that when said flap is pressed against the inner surface of said first tab, said first and second tabs will be held together, whereby said tabs may be easily separated to remove the hand gun by running a thumb between said fastening means but the hand gun cannot be pulled from the holster while said tabs are held together.

4,480,777

APPARATUS FOR CONVEYING STRIP MATERIAL

Seiji Suzuki, Nagoya; Kenji Kawate, Inuyama, and Hiroshi Tawara, Nagoya, all of Japan, assignors to Daidotokushuko Kabushikikaisha, Japan

Filed Jun. 14, 1982, Ser. No. 388,297

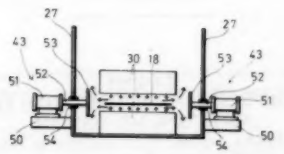
Claims priority, application Japan, Jun. 15, 1981, 56-92889

Int. Cl.³ B65H *17/32, 25/26*

U.S. Cl. 226—15 **4 Claims**

1. An apparatus for conveying strip materials which includes a pair of plenum chambers vertically spaced apart from each other with a predetermined course of conveyance of the strips located between said plenum chambers and adapted to blow

gases toward said predetermined course of conveyance so as to float the strip when the strip is allowed to travel along said predetermined course of conveyance and is characterized in that a pair of means for controlling the rate of flow of gases are provided in conjunction with said plenum chambers and in opposite positions horizontally spaced apart from each other with said predetermined course of conveyance located between said control means so that the gases blown against the strip may be so adjusted as to have a difference of flow rate between a portion of the gases streaming along the strip surface in one direction crossing said predetermined course of conveyance and the portion of the gases streaming in the opposite direction in the same manner, wherein said flow-rate control means each comprises a baffle plate having a side adapted to move toward or away from said predetermined course of conveyance so as to control the amount of gases streaming to



the side of the baffle plates wherein each said baffle plate is connected to operating means for moving said baffle plate toward or away from said predetermined course of conveyance, further including detecting means located by the side of said predetermined course of conveyance for detecting if the strip has deviated from said predetermined course of conveyance in a horizontaldirection and means connected to said detecting means and said baffle plate operating means for controlling said baffle plate operating means so as to cause said baffle plate operating means to move said baffle plates toward or away from said predetermined course of conveyance when said detecting means has perceived a horizontal deviation of the strip from said predetermined course of conveyance, so that said baffle plates vary the amount of gases streaming to the side of one of said baffle plates in relation to that of those streaming to the side of an opposite baffle plate so as to allow the strip to return to said predetermined course of conveyance.

4,480,778

HEEL NAILING MACHINE

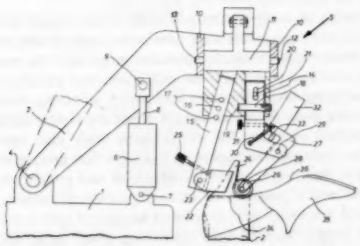
Gerhard Giebel, Bod Soden, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Sep. 7, 1982, Ser. No. 415,576

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1981, 3135358

Int. Cl.[3] **B27F** *9/00*; **A43D** *43/00, 95/04*

U.S. Cl. 227—40 **2 Claims**



1. A machine for nailing heels on the shoe uppers fitted with insole, in which the shoe upper is positioned on a nailing stand and a holddown presses the heel onto the shoe upper on the nailing stand while being gripped laterally by an arrangement of holding elements, wherein said holding elements are provided with a clamping arrangement for pressing the upper and the heel together, the holddown being pivotable sideways from the axis of said nailing stand wherein said clamping arrangement is operable to raise a heel complete with its attached shoe upper from said stand and to swing it in such a matter that upon release of the clamping arrangement in the swung position a shoe upper complete with its heel may be dropped down by the side of said nailing stand.

4,480,779

CONDUCTIVE CONNECTIONS

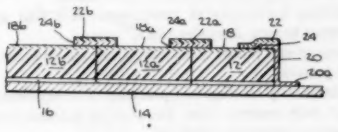
Penelope J. Luc, Bookham, England, assignor to Luc Technologies Limited, Leatherhead, England

Division of Ser. No. 109,644, Apr. 4, 1980, Pat. No. 4,355,199, which is a continuation of Ser. No. 731,082, Oct. 8, 1976, abandoned. This application Sep. 13, 1982, Ser. No. 417,163

Claims priority, application United Kingdom, Oct. 10, 1975, 41691/75

Int. Cl.[3] **B23K** *20/12*

U.S. Cl. 228—112 **4 Claims**



1. A method of making a conductive connection between an extremely thin metallized outer surface of a first film material and a metallic surface of a structure to which the film material is applied, said metallized outer surface of said first film material facing away from the metallic surface of the structure, said method comprising:

(a) providing an integral conductive member having a first portion in direct contact with the metallic surface of the structure and a second portion disposed adjacent the metallized layer of the first film material;

(b) providing an integral second film material, said second film material being thermoplastic and having at least one metallized surface thereon, a first portion of said second film material being in direct contact with said metallized layer of said first film material and a second portion of said second film material being in direct contact with the portion of said conductive member adjacent the metallized surface of said first film material; and

(c) bonding the first portion of the conductive member of the metallic surface of the structure with which it is in contact; bonding the first portion of said second film material to the metallized layer of said first film material with which it is in contact to form an electrical connection therebetween; and bonding the second portion of said conductive member and the second portion of said second film material in contact therewith to form an electrical connection to the metallized layer of said first film material, so as to achieve a secured electrical connection between the metallized layer of the first film material and the metallic surface of the structure, the bonding being achieved by a friction bonding process wherein a relative rubbing movement is provided between a tool and the surface of the first and second portions of said conductive member facing away from the surface of the structure and the surface of the first portion of the second film material facing away from the surface of the structure.

4,480,780

METHOD OF AND DEVICE FOR POSITIONING ELECTRICAL AND/OR ELECTRONIC COMPONENTS ON A SUBSTRATE

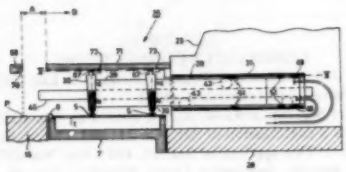
Louis V. Claeskens, and George Van de Ven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,881

Claims priority, application Netherlands, Jul. 29, 1981, 8103574

Int. Cl.[3] H01L *21/60*

U.S. Cl. 228—180 A 28 Claims



1. A method of positioning components on a substrate, in which a number of parts are simultaneously transferred from a pick-up position to a mounting position so as to be positioned on the substrate, characterized by comprising

presenting a plurality of components in a first geometric pattern having a regular pitch,

picking up said plurality of components, in said first geometric pattern,

simultaneously moving said plurality of components along a first path segment from the pick-up position toward respective mounting positions,

then changing the relative positions of the components to at least a second, different geometric pattern, and

positioning said components on a substrate in a geometric pattern different from said first pattern.

4,480,781

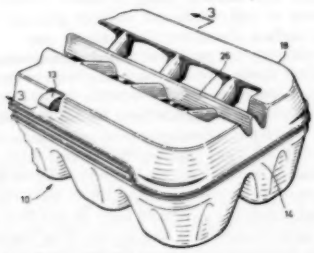
MOULDED EGG CARTON WITH FINGERS FOR SUPPORTING THE EGG

Roy W. Emery, 1 Donino Ct., Toronto, Ontario, Canada (M4N 2H6), and John R. Emery, 83 Ames Cir., Don Mills, Ontario, Canada (M4N 2M8)

Filed Mar. 16, 1983, Ser. No. 475,758

Int. Cl.[3] B65D *85/32*

U.S. Cl. 229—2.5 EC 2 Claims



1. A moulded carton comprises:

a tray;

a hinged cover for the tray;

the tray having a series of upwardly extending posts that partially divides the tray into a series of cells on each side of the series of posts the improvement of a cover configuration that has a stabilizing rib that sits on the top of the posts of said series of posts when the cover overlies the tray;

a series of window openings in said cover on each side of said rib to expose to view the cells of each of said series of cells;

resilient finger means integrally moulded to extend downwardly and outwardly of the rib into each cell of each of said series of cells to overlie an article in the cell in use;

said resilient finger means having a length to engage with an egg in its respective cell to provide support for an article in said cell when the cover is closed on the tray in use;

said resilient finger means comprising at least two fingers, one on each side of the vertically extending centre of the cell whereby to provide vertical and lateral support to an egg in said cell when the cover is closed on the tray in use.

4,480,782

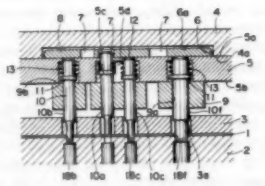
PUNCH PRESS DIE ASSEMBLY WITH PUNCH SELECTING MECHANISM

Satomi Morishima, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 30, 1982, Ser. No. 454,676

Int. Cl.[3] B26F *1/04*

U.S. Cl. 234—98 7 Claims



1. A simplified punch press die assembly with a punch selecting mechanism, comprising:

a punching die for mounting a work to be punched;

a vertically movable upper die holder located over said punching die;

a plurality of punches supported on the lower side of said upper die holder and vertically movable with and relative to said upper die holder;

a plurality of springs urging said punches downwardly relative to said upper die holder;

a punch selecting plate located on the upper ends of said punches and switchable to one of a plurality of predetermined positions by sliding movements perpendicular to the axes of said punches for selecting one of predetermined punching patterns;

a plurality of escape holes provided in said punch selecting plate and engageable with unselected ones of said punches to render said unselected punches inoperative by positioning said escape holes over said unselected punches;

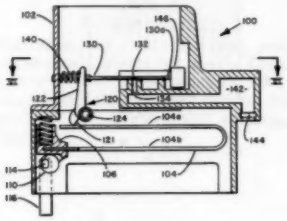
an operating lever linked to said punch selecting plate; and

a selector plate mounted on said upper die holder defining a punched aperture for engagement with said operating lever, said punched aperture having a first groove extending in the direction of movements of said punch selecting plate and a plurality of second grooves branching sideward from said first groove at staggered positions along the length thereof, said operating lever being shiftable through said first groove for engagement with one of said second grooves thereby to change the position of said punch selecting plate relative to said selector plate and to change the combination of said unselected punches.

4,480,783
VAV TERMINAL LOCAL CONTROL LOOP

William E. Clark, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 2, 1983, Ser. No. 528,820
Int. Cl.³ G05D 23/08
U.S. Cl. 236—87 2 Claims



1. A terminal control loop for use in a variable air volume system for controlling the amount of conditioned air supplied to a zone comprising:

means for supplying conditioned air to a zone;

bleed thermostat means for controlling said means for supplying conditioned air to a zone including:

(a) thermostatically responsive means;

(b) means for providing a temperature set point and positioning said thermostatically responsive means responsive thereto;

(c) means for supplying pressurized air to said bleed thermostat means; and

(d) bleed plate means positioned responsive to said means for providing a temperature set point and the thermostatic response of the thermostatically responsive means to control bleeding of said pressurized air from said bleed thermostat means;

means for sensing the position of said bleed plate means and providing a first signal indicative thereof;

means for providing a second signal indicative of a predetermined position of said bleed plate means;

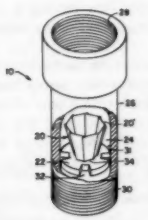
means for determining the difference between said first and second signals and for producing an output signal indicative thereof; and

means for producing a signal indicative of terminal satisfaction responsive to said output signal.

4,480,784
HOT WATER CUTOFF SAFETY VALVE FOR SHOWERS

Milton D. Bennett, 2218 Farringdon Rd., Baltimore, Md. 21209

Filed Jun. 3, 1983, Ser. No. 500,999
Int. Cl.³ G05D 23/08
U.S. Cl. 236—93 B 1 Claim

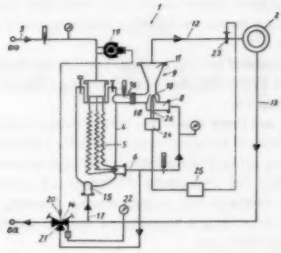


1. A system for preventing scalding of a user of a water shower nozzle, comprising in combination: a length of pipe having a bore, means for connecting the length of pipe in a water supply to a said shower nozzle, a radially expansible thermostatic element for reducing flow of water in proportion to temperature elevation of said water, means freely supporting the thermostatic element for self-centering in said bore, means for assuring automatic reset of said thermostatic element for restoration of flow upon water temperature reduction, said thermostatic element being a thermostatic cup, said means freely supporting comprising a perforate transverse platform in said bore, and said means for assuring automatic reset comprising means for preserving a drip of water past the thermostataic element upon said reduction, including said thermostatic element being polygonal and said bore being circular.

4,480,785
METHOD AND APPARATUS FOR THE REGULATED TRANSFER OF HEAT FROM A PRIMARY STEAM NETWORK TO A HEAT CONSUMER

Helmut Bälz, Koepffstrasse 5, D-7100 Heilbronn, Fed. Rep. of Germany

PCT No. PCT/DE81/00149, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982, PCT Pub. No. WO82/01057, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 21, 1981, Ser. No. 385,387
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035779
Int. Cl.³ B60H 1/00
U.S. Cl. 237—6 5 Claims



1. An apparatus for the regulated transfer of heat from a primary steam network (010, 012) to a heat consumer (2), having a heat exchanger (4) regulated by means of condensate accumulation in accordance with the temperature at the heat consumer;

the heat exchanger (4) being connected on the steam side with the steam network (010) and on the condensate side with the injection nozzle of the jet pump (9) located in the supply conduit of the heat consumer,

the injection nozzle of the jet pump being exposed to condensate at a predetermined overpressure, and the jet pump being located on the intake side in a secondary circuit (17, 15, 16) of the heat exchanger (16) in which secondary medium is heated by the steam flow,

the jet pump mixing secondary medium and condensate at over pressure with a predetermined proportion to supply the heat consumer,

characterized in that

the heat exchanger (4) is connected directly to the steam network (010);

and the jet pump (9), in order to regulate the amount of heat transferred, includes a regulatable injection nozzle (10); an actuator (24), a control device (25) and a temperature sensor (23) located to measure the temperature of the supply of the heat consumer (2); being provided, the temperature sensor signalling the temperature of the mixture being supplied to the consumer to the controller, the controller controlling said actuator (24) to regulate the regulatable nozzle to control said proportion to maintain a predetermined temperature at the sensor, and hence at the consumer.

4,480,786

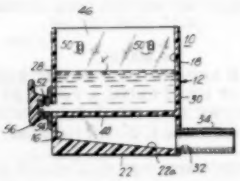
HUMIDIFIER, VAPORIZER AND ROOM FRESHENER

Ronald S. Haywood, 1273 SE. Second Terrace, P.O. Box 8647, Deerfield Beach, Fla. 33441, and Melvin L. Landini, 73 Hutchinson Ave., Hawthorne, N.J. 07576

Filed May 16, 1983, Ser. No. 494,903

Int. Cl.³ F24F 3/14

U.S. Cl. 237—78 R **6 Claims**



1. A device for use in line with a steam heating radiator having application as a humidifier and a vaporizer for dispersal of volatile fluids, comprising:

an outer chamber having a steam inlet opening;

means for connecting said inlet opening to the steam radiator for passage of steam vapor into said outer chamber, said connecting means including a nipple secured in said inlet opening;

an inner chamber having a steam venting opening, said inner chamber being disposed in telescoping relation within said outer chamber;

said outer and inner chambers being spaced apart to define a steam channel between said chambers, said steam channel extending around the periphery of said inner chamber;

valve means for regulating discharge of steam from the radiator through said steam venting opening, said valve means comprising a plurality of spaced apertures in said inner chamber; and

means for continuously draining steam condensation from said outer chamber to the radiator, said drainage means including an inclined base surface in said outer chamber;

the device being operable in a first mode as a humidifier by regulation of the emission of steam vapor from the steam radiator system through the steam venting opening, the device being operable in a second mode as a vaporizer when volatile fluids are received in said inner chamber for controlled vaporization by steam vapor.

4,480,787

RAIL FASTENING DEVICE

Shuichi Okumura, 7-9, Ohmachi 7-chome, Kamakura-shi Kanagawa, Japan

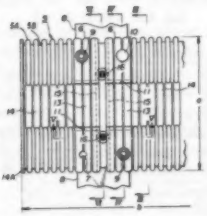
Filed Sep. 20, 1982, Ser. No. 420,063

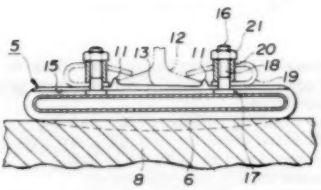
Claims priority, application Japan, Jul. 28, 1982, 57-130298

Int. Cl.³ E01B 9/62

U.S. Cl. 238—264 **9 Claims**

1. A rail fastening device for supporting a rail on a plurality of spaced ties, comprising: an elongate, flat bellows-shaped, intermediate member incorporating a plurality of tie-mounting portions spaced therealong at preset intervals for engaging spaced ties; a spike member for securing each of said tie-mounting portions of the intermediate member to a corresponding one of a plurality of ties; a bolt for securing a rail to said intermediate member; and a plate spring clip biased by said bolt to





strongly hold the base portion of said rail to the corresponding one of the tie-mounting portions of the intermediate member.

4,480,788

SNOW GUN

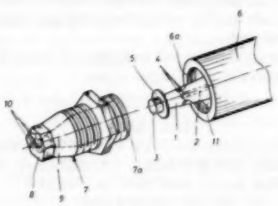
Michael Manhart, Hinterwies, 6764 Lech a, Arlberg, Austria

Filed Sep. 28, 1982, Ser. No. 425,180

Claims priority, application European Pat. Off., Jan. 18, 1982, 82200057.6

Int. Cl.³ F25C 3/04

U.S. Cl. 239—14 **6 Claims**



1. A snow gun comprising,

a central compressed-air supply line,

a pressurized-water supply line having a central axis disposed coaxially with and surrounding said compressed-air supply line,

an annular chamber bounded by said compressed-air supply line and said pressurized-water supply line,

two or more inner nozzles forming part of said compressed-air supply line and interconnecting the two said supply lines, said inner nozzles having central axes forming an acute angle with the central axis of said pressurized water supply line,

a spray head attached at one end thereof to said pressurized-water supply line and including an interior space, and

a perforated end piece attached to the other end of said spray head and bounding said interior space, said compressed-air supply line opening out into said interior space,

wherein the radial width of said annular chamber in the vicinity of said inner nozzles satisfies the equation

$l=2\pi r_i\sqrt{n_i/3}$

wherein l is the said radial width, n is a number from 1 to 3, n_i is the number of said inner nozzles, and r_i is the radius of said inner nozzles.

4,480,789

WATER NOZZLE

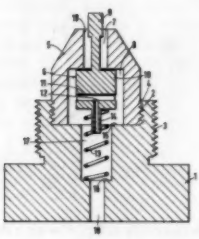
Franz Kemper, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 264,669, May 15, 1981, abandoned. This application Jun. 22, 1983, Ser. No. 506,585

Claims priority, application Fed. Rep. of Germany, May 20, 1980, 8013540[U]

Int. Cl.³ B05H *15/02*

U.S. Cl. 239—116 **10 Claims**



1. A water nozzle connectable with a water supply conduit, particularly for dust suppressing for example at cutting rollers, comprising

a housing having a central opening with an axis;

a guiding sleeve received at least partially in said central opening of said housing and having an inner passage which is stepped in an axial direction;

a piston stepped in the axial direction and having an enlarged piston portion displaceable in said passage of said guiding sleeve in a first axial direction under the action of flow of water; and

a spring urging said piston in a second axial direction which is opposite to said first axial direction, said piston and said guiding sleeve being formed so that when said piston is displaced by the flow of water in said first axial direction, a single narrow gap with smooth walls and of a constant cross section in the axial direction is formed between said enlarged piston portion of said piston and said guiding sleeve, so that the water can flow through said gap but solid particles entrained in water and exceeding said gap cannot pass therethrough and therefore interrupt the flow of water, whereby when said spring displaces said piston in said second axial direction said enlarged piston portion of said piston displaces in said gap without being completely withdrawn therefrom and dislodges the solid particles from said gap intact, because said gap is single and has smooth walls and constant cross section, so as to displace the solid particles toward a water supply conduit.

4,480,790

ROTARY BURNER

Paul Flanagan, Northboro, and Mark S. Chumsae, Shrewsbury, both of Mass., assignors to Coppus Engineering Corporation, Worcester, Mass.

Filed Dec. 27, 1982, Ser. No. 453,815

Int. Cl.³ B05B *3/06*

U.S. Cl. 239—214.25 **4 Claims**

1. A rotary-type fuel burner comprising:

a stationary inner bearing support surrounded by an outer housing, said bearing support and said housing cooperating in a radially spaced relationship to define a substantially annular housing chamber having axially aligned inlet and outlet openings;

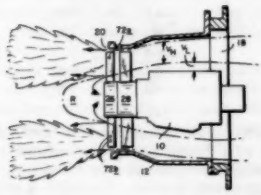
a shaft extending through and journalled for rotation in bearings carried by said bearing support;

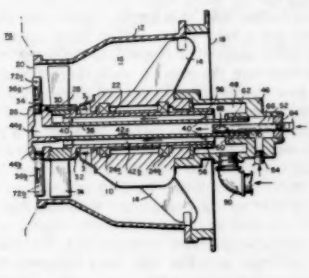
a hub fixed to said shaft at a location adjacent to said outlet opening,

a plurality of hollow driver arms extending radially outwardly from said hub, said arms having nozzles communicating with the interiors thereof;

conduit means extending through said shaft and said hub into communication with said 'river arms for conveying pressurized fuel thereto, the arrangement of said nozzles with respect to the rotational axis of said shaft being such that the reactive force produced by pressurized fuel exiting through said nozzles will cause said shaft to be rotatively driven; and

a fan mounted for rotation with said shaft, said fan being located in said chamber interiorly of said hub and said





driver arms and being operative during shaft rotation to induce a flow of combustion air which enters said chamber through said inlet opening and which exits from said chamber through said outlet opening, the said combustion air flow having an outer annular high velocity zone adjacent to said housing and an inner annular low velocity zone adjacent to said bearing support, the air flow in said inner low velocity zone having a tendency upon exiting through said outlet opening to collapse inwardly into a central region adjacent to said hub, and the air flow in said outer high velocity zone having a tendency to proceed to a combustion zone located axially beyond said central region,

said nozzles being located entirely in said outer high velocity zone, whereupon the fuel exiting therefrom is mixed with the air flow in said high velocity zone for ignition and combustion in an annular flame pattern, with said central region remaining essentially flame-free.

4,480,791

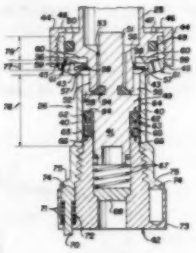
SPRAYER APPARATUS

Jarrel D. Ward, P.O. Box 272, Rodessa, La. 71069; Richard E. Turner, deceased, late of Palo Pinto, Tex.; by Betty L. Turner, heiress, 1403 Southeast 20th St., Mineral Wells, Tex. 76067; by Christina G. Blais, heiress, 1407 Woodbine Ct., Arlington, Tex. 76012; by Terry L. Turner, heiress, 7606 Currin, Dallas, Tex. 75230, and by Jane E. Shurley, heiress, 1003 Eagle Dr. #125, Denton, Tex. 76201

Filed Jun. 25, 1982, Ser. No. 392,008

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—533.15 **7 Claims**



1. A spray nozzle unit adapted for removable attachment to a tubular inlet fitting having a peripheral attachment collar placed above the outlet end of the fitting, said nozzle unit comprising a body member, a plunger, a control insert and a fluid dispersal ring, said body member being tubular and having a first section of intermediate bore diameter, a second section of smaller bore diameter, a third section of larger bore diameter, tapered wall portions between said sections and a plurality of outlet orifices spaced around the tapered wall portion adjacent said third section, the bore diameter of said second section being larger than the outside diameter of said fitting below said attachment collar, said plunger having a piston and a base with a seal member carried therebetween, said piston adapted to extend into the outlet end of said fitting to define with the internal walls thereof a metering passage, said base having at least a portion thereof of a diameter matching the bore diameter of said second section of said body member for slidable relative motion between said plunger and said body member to bring said seal member into and out of sealing engagement with the outlet end of said inlet fitting, said control insert having means holding said plunger seal member in unyieldable sealing engagement with said inlet fitting when in a first position and means yieldably urging said seal member into sealing engagement with the end of said inlet fitting when in a different position, said fluid dispersal ring being fitted around said inlet fitting below said collar, whereby the internal walls of said body member, the external walls of said fitting and said fluid dispersal ring define an equal pressure and volume chamber, an outlet chamber and an equal dispersal passage therebetween.

4,480,792

FUEL INJECTOR WITH GEAR-DRIVEN CALIBRATION OF NEEDLE

Patrick Renaud, Versailles, and Jean-Paul Bourget, Lesigny, both of France, assignors to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint Denis, France

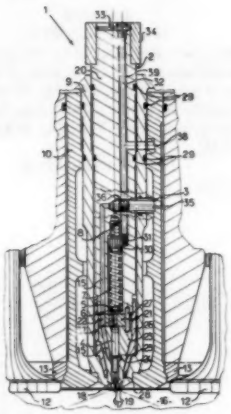
Filed Jun. 22, 1982, Ser. No. 390,928

Claims priority, application France, Aug. 7, 1981, 81 15406

Int. Cl.³ F02M *61/10*

U.S. Cl. 239—533.6 **1 Claim**

1. A fuel injector for an internal combustion engine, the fuel injector comprising a substantially cylindrical body having a fuel injection conduit extending substantially parallel to the longitudinal axis of the body and provided with a lateral fuel inlet, said body containing, in longitudinal succession, an injection needle continued by an elongate push-member provided with a head upon which bears a return spring urging the injection needle to the closed position and pre-stressed by means of an adjusting screw, wherein the improvement comprises the



adjusting screw is coaxially integral with a driven pinion meshing with a driving pinion coaxially integral with a driving stem mounted rotatably in the body of the injector and extending up to the upper end of the injector so that it can be operated from the outside of the cylindrical body.

4,480,793

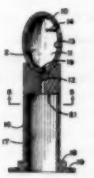
LIQUID DISTRIBUTION DEVICE

Gary R. Grande, 5395 S. Ravendale Cir., Las Vegas, Nev. 89120

Filed Jul. 2, 1981, Ser. No. 279,840

Int. Cl.³ B05B *1/14*

U.S. Cl. 239—567 **20 Claims**



1. A turf irrigation device adapted to be connected to a pressurized liquid source comprising

a body member having a substantially unobstructed hollow chamber therein having upper and lower portions, said chamber being defined at least in part by one or more walls,

a single liquid inlet means in the lower portion of the chamber for passing a jet of water upwardly into said chamber,

a plurality of liquid discharge ports in the upper portion of the chamber walls, at least two of said ports being disposed radially from a vertical axis of the chamber such that fluid exits along an axis angularly disposed from said vertical axis, said chamber having an enclosed upper wall at a top portion of the chamber precluding passage of a substantial portion of fluid out from the chamber in a direction parallel to the vertical axis of the chamber,

the upper portion of said chamber having substantially curvilinear horizontal and vertical cross-sections,

the lower portion of the chamber having a curvilinear horizontal cross-section, said upper and lower portions being

connected by smooth walls having substantially no discontinuity,

the total cross-sectional area of the discharge ports being at least about 1.4 times greater than the cross-sectional area of the inlet means,

whereby a rotating mass of water is created in the chamber, producing rapidly moving discharges of discrete droplets from the discharge ports.

4,480,794

AIR SEEDER DISTRIBUTOR

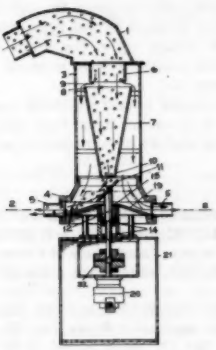
Albert K. Fuss, 1 Jellicoe St.; Eric W. Fuss, 3 Heller St.; Jarvis R. Fuss, 143 Tourist Rd., and Roy M. Fuss, 21 Leslie St., all of Toowoomba, Queensland, Australia 4350

Filed Dec. 17, 1982, Ser. No. 450,733

Claims priority, application Australia, Nov. 9, 1982, PF6709

Int. Cl.[3] A01C *15/04*

U.S. Cl. 239—654 4 Claims



1. A seed and/or fertiliser distributor for air seeders comprising a rotating distributor to sequentially direct seed and/or fertiliser to a series of outlets on a distributor drum, characterised by

a housing extending from an air and seed and/or fertiliser supply duct to a distributor drum having a series of outlets around its periphery,

a rotatable shaft coaxial in said distributor drum carrying within said distributor drum an inclined deflector member,

means to drive the said shaft,

a nozzle on said supply duct directed into said housing to be coaxial therewith to discharge seed and/or fertiliser on to said deflector member, and

a truncated conical separator guide coaxial within the said housing having its larger end adjacent to the said nozzle and of greater diameter than the said nozzle to leave a space therebetween and its truncated end of smaller diameter than the said nozzle and terminating adjacent to the said deflector member,

whereby seed and/or fertiliser and some air is directed through said separator guide on to said distributor member to be sequentially directed to said outlets on said distributor drum as said distributor member is rotated, but the remaining air flows through said space to between said separator guide and said cylindrical housing directly to the said outlets on the said distributor drum.

4,480,795

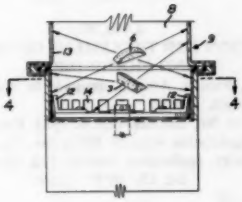
METHOD FOR CLEANING WASTE DISPOSAL UNITS

Lawrence A. Pellegrino, 2136 Cherrystone Dr., San Jose, Calif. 95128

Filed Apr. 2, 1982, Ser. No. 364,982

Int. Cl.[3] B02C *23/00*

U.S. Cl. 241—30 15 Claims



1. The method of cleaning the interior surface of a waste disposal unit equipped with a catch basin forming an interior cavity and having grinding elements disposed within the cavity, comprising the steps of:

(a) depositing within the interior cavity of the waste disposal unit at least one highly resilient body, said body having a degree of resilience sufficiently high to cause said body to rebound continuously without damage from moving grinding elements of the disposal unit; and

(b) agitating said at least one highly resilient body while said body is confined within the waste disposal unit cavity, whereby said highly resilient body is propelled in trajectories and at velocities which cause said body repeatedly to impact against and rebound from the interior surfaces thereof to effect a scouring action thereon.

4,480,796

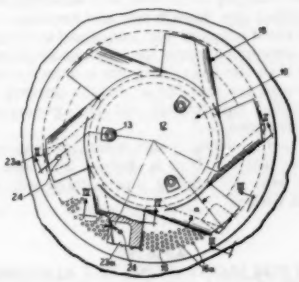
PULPING APPARATUS INCLUDING IMPROVED ROTOR

Stavros Paraskevas, Pittsfield, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 25, 1982, Ser. No. 342,346

Int. Cl.[3] B02C *13/18*

U.S. Cl. 241—46.11 7 Claims



1. A rotor for use in association with an extraction plate adapted for defibering liquid slurry stock and causing defibered material to pass through said extraction plate, said rotor comprising:

a central body portion;

a plurality of vanes extending in a generally tangential direction from said central body portion and each having an extraction side, a leading face and a trailing surface, the leading face of each vane including a generally circular convex forward edge of relatively small radius of curva-

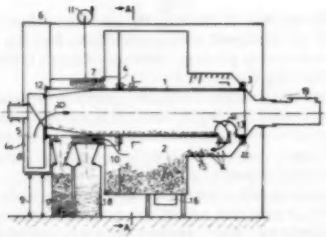
ture and which extends substantially linearly in said generally tangential direction, said forward edge merging into a concave central portion having a substantially larger radius of curvature than said small radius of curvature, said central portion merging into a smooth surfaced bottom face having a trailing edge, and a smoothly contoured convex airfoil trailing surface extending from said forward edge to the trailing edge of said bottom face.

4,480,797

INSTALLATION FOR TREATMENT OF WASTE METAL AND LIQUID DROSS

Anton Weiss, Vienna, Austria, assignor to Waagner-Biro Aktiengesellschaft, Austria

Division of Ser. No. 232,309, Feb. 6, 1981, Pat. No. 4,394,978. This application Aug. 20, 1982, Ser. No. 409,991
Claims priority, application Austria, Feb. 18, 1980, 870/80
Int. Cl.³ B02C *17/04*
U.S. Cl. 241—65 **13 Claims**



1. Apparatus for treating liquid dross obtained from metal smelting and remelting apparatus, comprising:

an autogenous grinding mill;

a cooling pipe rotatably mounted within said grinding mill and having an inlet opening at an inlet side thereof, said inlet opening of said cooling pipe situated outside said grinding mill, and a substantially smooth inner surface at least in the region of the inlet thereof;

means associated with said cooling pipe for cooling the same;

a skimming trough located adjacent to said cooling pipe inlet opening;

means for charging dross from said skimming trough into said cooling pipe through said inlet opening;

a hood located over said inlet side of said cooling pipe, said hood constituting means for substantially preventing entrance of air into said cooling pipe as dross is charged from said trough into said pipe so that the entrance of air into said cooling pipe through said inlet opening is substantially prevented; and

wherein said skimming trough is sealingly engaged to said hood so that the dross is charged from said skimming trough into said cooling pipe without any substantial contact with air.

4,480,798

SYSTEM FOR MAINTAINING THE ALIGNMENT OF MANDRELS IN FILAMENT WINDING OPERATIONS

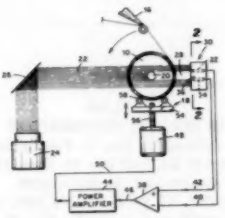
Samuel C. Robinson, Clinton; William G. Dodge, Oak Ridge, and Roy E. Pollard, Powell, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1983, Ser. No. 541,187
Int. Cl.³ B65H *54/02*
U.S. Cl. 242—18 R **4 Claims**

1. A mandrel alignment system for a filament winding apparatus wherein filamentary material is wound about a mandrel having a position reference pin extending therefrom and supported by adjustable support means for maintaining the mandrel in a selected position for receiving the filamentary material, comprising;

light beam transmitting means for projecting a beam of light of a cross section greater than the cross section of the reference pin across the latter for bisecting the light beam and creating a shadow therebetween indicative of the cross section of the reference pin;

signal generating light-detecting means disposed to receive a change in light volume from said light beam when said pin



is displaced from a selected position during the winding of the filamentary material about the mandrel;

amplifier means coupled to said light detecting means for receiving a voltage signal therefrom indicative of the change in the volume of light received by said light detecting means, and

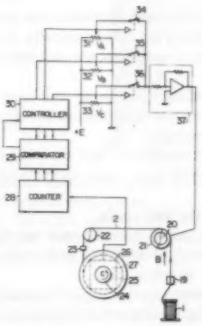
drive means coupled to said adjustable support means and responsive to an output signal from said amplifier means for returning said pin to said selected position.

4,480,799

APPARATUS FOR CONTROLLING TENSION APPLIED ONTO AN ELECTRIC WIRE IN A WINDING MACHINE

Kiyoshi Yano; Yukinori Taneda, both of Yokohama, and Takashi Kobayashi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1979, Ser. No. 101,271
Claims priority, application Japan, Dec. 22, 1978, 53-157474
Int. Cl.³ B65H *54/04, 59/38*
U.S. Cl. 242—25 R **5 Claims**



1. An apparatus for controlling tension applied onto an electric wire to be wound around a rotatably supported bobbin in a winding machine, comprising detecting means for detecting rotating position of said bobbin, wire winding means adapted to alter the rotating speed of said bobbin in dependence on the output from said detecting means, traverse means disposed movably in a direction parallel to the axis of said bobbin while holding said electric wire in a sandwiched manner to thereby allow said electric wire to be displaced and wound around said bobbin so that said electric wire is wound

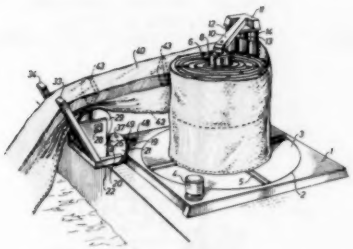
in perfect alignment with the preceding coil portion wound around said bobbin for forming a perfect layer coil, and electromagnetic brake means including a brake reel around which said electric wire is wound for a predetermined number of turns as dispensed from a supply reel and an electromagnetic brake for applying a brake force to said brake reel thereby to maintain said electric wire under tension, an improvement comprising control means operatively connected to said detecting means and said electromagnetic brake for determining rotational positions of said bobbin which precede respectively to those rotational positions by a magnitude corresponding to a time constant of said electromagnetic brake at which rotating speed of said bobbin is to be changed over among an accelerating rotation mode, decelerating rotation mode and a constant-speed rotation mode and setting brake voltages corresponding to said accelerating rotation mode, said decelerating rotation mode and said constant-speed rotation mode, respectively, wherein upon every occurrence of coincidence between the rotating position of said bobbin detected by said detecting means and the rotating position of said bobbin determined by said control means, the brake voltage corresponding to the succeeding rotation mode to be next established is applied to said electromagnetic brake thereby to produce the braking force corresponding to said succeeding rotation mode upon transition thereto, whereby tension applied to said electric wire is controlled to be substantially constant during the winding operation.

4,480,800

APPARATUS FOR REELING FLOATING BOOMS, PARTICULARLY SUCH AS ARE SELF-EXPANDING

Per O. Öberg, and Seth A. O. Österlund, both of Nordmaling, Sweden, assignors to Sanera Projecting Aktiebolag, Nordmaling, Sweden

Filed Dec. 16, 1982, Ser. No. 450,498
Claims priority, application Sweden, Dec. 23, 1981, 8107776
Int. Cl.[1] **E02B** *15/04;* **B65H** *75/02*
U.S. Cl. 242—55 **16 Claims**



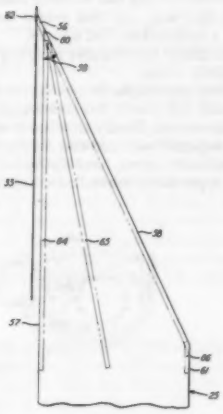
1. Apparatus in reeling up booms, including so-called self expanding booms, comprising: a vertically oriented winding means driven by a motor, the winding means being arranged for winding thereon of said boom in a flattened condition, first means defining at least one first roller oriented substantially parallel to the winding means and located upstream of and laterally adjacent to the winding means for cooperating in flattening the boom for winding on the winding means, and feed means defining a feed roller located upstream of said first roller (1) for guiding the boom during the winding operation and (2) for applying a braking force to the boom sufficient to press the boom against said first roller and thereby obtain said flattened condition of the boom as the boom is supplied to the winding means for winding thereon.

4,480,801

WEBBING SYSTEM

Rex D. Stone, York, Pa., assignor to Motter Printing Press Co., York, Pa.

Filed May 13, 1982, Ser. No. 377,607
Int. Cl.[3] **B65H** *19/28;* **B41F** *13/02*
U.S. Cl. 242—56 R **9 Claims**



1. Apparatus for threading a web from a web unwind roll through a printing press having a pair of side frames between which are mounted press elements of at least one press unit, each unit including a plurality of lead rollers for guiding the web through the unit and between a first cylinder adapted to apply ink to the web and a second cylinder, comprising

a cable disposed between the side frames and extending substantially parallel to and coplanar with the path of the web through the printing press,

a plurality of sheaves for supporting the cable, each sheave mounted adjacent to and coaxially with a different one of the lead rollers, the diameter of each sheave being such that the centerline of the portion of the cable engaged by the sheave is substantially coplanar with the surface of the corresponding lead roller,

means for connecting the leading edge of the web to the cable, and

means for driving the cable in the direction to feed the web through the printing press, and wherein

the connecting means includes a leader attached to the leading edge of the web and to the cable,

the cable includes means forming a ring and the leader includes a hook adapted to engage the ring means, and

the leader includes a belting to one end of which the hook is secured and a plastic film of generally triangular shape, the leading corner of the film being connected to the other end of the belting and the opposite side of the film being attached to the leading edge of the web.

4,480,802

SILENCER OF ANTI-REVERSE FISHING REEL

Paul P. H. Chang, and Cheng-Hsiang Chu, both of Room 3, 7th Fl., No. 603, Tung-Hwa S. Rd., Taipei, Taiwan

Filed Jul. 13, 1982, Ser. No. 397,869
Int. Cl.[3] **A01K** *89/00*
U.S. Cl. 242—84.2 R **9 Claims**

1. A fishing reel comprising:

a housing;

winding means, rotatably journalled to said housing and having a spool for storing a length of a filament, said winding means rotating in a winding direction, said filament winding onto said spool when said winding means rotates in said winding direction, said filament unwinding

from said spool when said spool rotates in an unwinding direction;

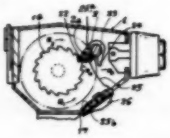
disk means, rotatably journalled to said housing and operatively coupled to said winding means, for driving said winding means to rotate, said disk means rotatable in first and second directions, said first direction being opposite to said second direction, rotation of said disk means in said first direction driving said winding means to rotate in said winding direction, said disk means including means for defining a substantially flat surface;

transmission means for rotatably coupling said disk means to said winding means;

handle means, manipulatable by a user and operatively coupled to said disk means, for rotating said disk means;

ratchet wheel means, fixedly attached to said disk means, for rotating together with said disk means, said ratchet wheel means including means for defining a plurality of teeth;

catch means, pivotably journalled to said housing, for pivoting between a first and a second position, said catch means including means for defining a first extended portion, said first extended portion engagable with said teeth of said ratchet wheel means to prevent rotation of said ratchet wheel means in said second direction;



actuating means, manipulatable by the user, for selectively pivoting said catch means to one of said first and second positions; and

rubbing block means, disposed on said first extended portion of said catch means and in slidable frictional contact with said surface of said disk means, for engaging said first extended portion with said teeth of said ratchet wheel means when said disk means rotates in said second direction and said catch means is pivoted in said first position, and for disengaging said first extended portion from said teeth when said disk means rotates in said first direction to prevent emanation of sounds resulting when said ratchet wheel means rotates while in contact with said first extended portion.

4,480,803

FISHING SPINNING REELS

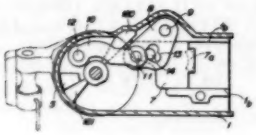
Kounin Sazaki, Fukuyama, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jul. 26, 1982, Ser. No. 401,862

Claims priority, application Japan, Jul. 28, 1981, 56-112826[U]

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 G **2 Claims**



1. A fishing spinning reel comprising:

a main body of a reel;

a rotor supported by said main body and provided with a pair of arms formed on a periphery of said rotor at diametrically opposing positions;

a bail arm lever and a pivot cam mounted on said pair of arms of said rotor, respectively;

a spring-biased bail arm having two ends, one end thereof being secured to said bail arm lever and another end thereof being secured to said pivot cam;

a kick lever slidably mounted on one of said pair of arms of said rotor and being slideable in response to rotation of said rotor;

a link lever pivotably supported on said one of said pair of arms and being swingable about its pivot support in response to sliding movement of said kick lever;

a heart-shaped cam slot having two lobes formed on said link lever;

a pin projecting from the end of said kick lever and projecting into said cam slot and said pin being guided by the inner periphery of said cam slot, said pin entering one lobe of the heart-shaped cam slot upon the sliding movement of said kick lever between a line casting position and a line winding position, and said pin entering the other lobe of said heart-shaped cam slot upon rotation of said bail arm lever when the reel is in the line casting position thereby preventing the premature return to the line winding position; and

a connecting lever pivotably connected to said link lever and to one of said pivot cam and bail arm lever, the amount of movement of said connecting lever being in predetermined proportion to that of said kick lever.

4,480,804

WEBBING LOCK DEVICE

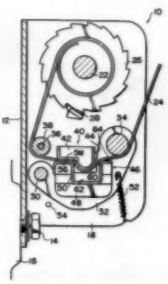
Takayuki Ando, Okazaki, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Japan

Filed Feb. 12, 1982, Ser. No. 348,182

Claims priority, application Japan, Mar. 30, 1981, 56-45040[U]

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.2 **8 Claims**



5. In a web locking device for use in locking an occupant restraining web and having means for receiving one end of said occupant restraining web and means for clamping said web at an intermediate portion to prevent web movement, the improvement in said web locking device comprising:

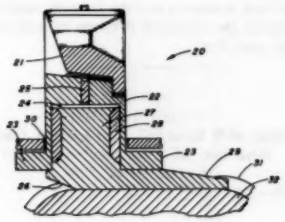
means for engaging said web at a position between said intermediate portion of said web and an occupant restraining portion of said web to attenuate tension in said intermediate portion, said means for engaging comprising a first portion for engaging said web and means responsive to web movement for causing said web to engage said first portion.

4,480,805

TRAVERSE YARN GUIDE

Harold G. Sachleben, Bellmawr, N.J., and Theodore A. Rayman, Chester, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 11, 1983, Ser. No. 474,660
Int. Cl.³ B65H *57/28*
U.S. Cl. 242—157 R **6 Claims**



1. A traverse yarn guide for use with a winder which includes a cam, a groove in said cam, and a guide slot substantially parallel to the axis of said cam, said guide comprising:

a. a body of synthetic material, said body having

(1) at least one flange for retention of the body in a guide slot, and

(2) a depression;

b. a shoe having an end made of synthetic material for pivotal movement into said depression, the other end of the shoe being shaped to follow a groove in a cam and having a width of at most 0.457 cm;

c. a yarn guide of wear resistant material attached to said body and separated from said depression; and

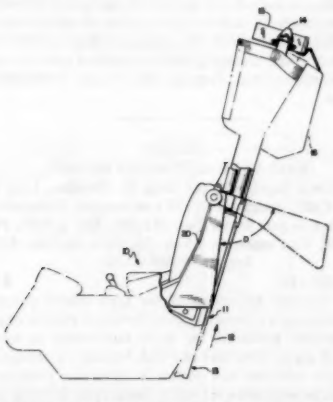
d. a metal guard plate, partially embedded in and projecting from said body on either side of said yarn guide to prevent yarn to body contact during yarn stringup.

4,480,806

EJECTION SEAT STABILIZATION APPARATUS

James W. Duncan, Arden, N.C., assignor to Stencel Aero Engineering Corporation, Arden, N.C.

Filed Nov. 8, 1982, Ser. No. 439,933
Int. Cl.³ B64D *25/10*
U.S. Cl. 244—122 A **7 Claims**



1. An apparatus for aerodynamically yaw-stabilizing an aircraft seat after ejection of the seat and its occupant from the aircraft and deployment of a drogue parachute but before deployment of a supporting parachute, the seat being of the type having side structural members lying in generally vertical, parallel planes generally defining the lateral limits of the seat back, the apparatus comprising the combination of:

first and second yaw stabilizing fins, each of said fins having an elongated shape, one of said fins being designated for use on the left side of the seat and the other for use on the right side, one end portion of said fins being bent to lie at an obtuse angle A relative to the remaining major portion thereof; and

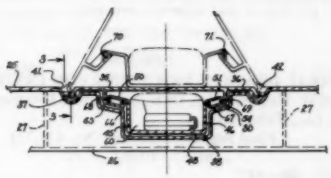
first and second means, attached respectively to the side members of said seat and to said end portions of said fins, for rotatably supporting said fins for movement between a stowed position in which said end portions of said fins lie in planes forming an acute angle B with the planes containing said side members and said remaining major portions of said fins lie in planes generally parallel with said side members and a deployed position in which said fins are rotated to the rear of said seat through an angle of between about 80° and about 120° from said stowed position to rearwardly extending positions and in which said major portions lie in outwardly extending planes forming an acute angle C with the planes containing said side members and forming an acute angle 2 C with each other.

4,480,807

WING CHUTE DEPLOYMENT SYSTEM

Arthur D. Bowen, 509 E. Vogel St. #3, Phoenix, Ariz. 85020

Filed Sep. 13, 1982, Ser. No. 417,175
Int. Cl.³ B64D *17/62, 17/80*
U.S. Cl. 244—139 **6 Claims**



1. An aircraft emergency descent system, for use in an aircraft having wings with upper and lower surfaces defining a space therebetween, comprising:

a. a tray positioned in said space for supporting a parachute pack;

b. a pair of emergency doors each having an upper surface formed from the upper surface of a wing, each of said doors including an operating arm depending therefrom;

c. each of said operating arms connected to said tray for lifting, as said emergency doors are opened, said tray toward an air stream passing over said wing.

4,480,808

CABLE CLAMP

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Oct. 1, 1982, Ser. No. 432,236
Int. Cl.³ F16L *3/10*
U.S. Cl. 248—73 **10 Claims**

1. Cable clamp means for securing a cable to an adjacent structure comprising:

first and second identical clamp members each adapted to be positioned for complementary engagement with the other, each clamp member including

a base portion;

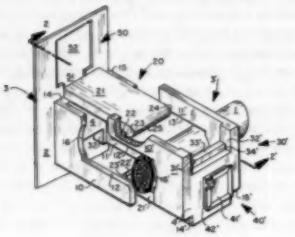
a pair of positioning arms spaced apart and attached to said base portion;

a pair of positioning arm guides formed in said base portion, said positioning arm guides of said first clamp member each receiving one of said positioning arms of said second clamp member and said positioning arm

guides of said second clamp member each receiving one of said positioning arms of said first clamp member;

latch means attached to said base portion;

catch means attached to said base portion, said latch means of said first clamp member engaging said catch means of said second clamp member, said latch means of said second clamp member engaging said catch means of said first clamp member;



a cable engaging surface included in each of said positioning arms, said cable engaging surfaces associated with each clamp member positioned opposite one another and in contact with said cable, to grip and thus to secure said cable; and

connecting means formed integrally with said base portion, said connecting means serving to mount said base portion to said adjacent structure.

4,480,809

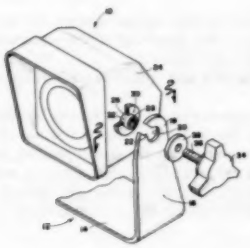
GIMBAL BRACKET MOUNTING FOR INSTRUMENT

Robert W. Healey, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed Sep. 22, 1982, Ser. No. 421,721

Int. Cl.[3] F16M *11/10*

U.S. Cl. 248—185 **3 Claims**



1. An improved means of pivotally supporting a housing comprising:

a support bracket in combination with a housing, said bracket having spaced apart parallel planar portions, the housing being received between the planar portions, each of the bracket planar portions having an opening therethrough of preselected diameter, the openings being coaxial, and the bracket planar portions each having slots extending from one edge thereof and communicating with the opening therein, the width of said slots being less than the diameter of said openings, the bracket planar portions being normally spaced apart of a width equal to or less than the width of the housing and being resiliently deflectable away from each other;

tubular trunnions extending in a common axis from opposite sides of the housing, each trunnion having an external diameter less than the diameter of said openings in said bracket planar portions and greater than the width of said slots, the tubular opening in each of said trunnions being threaded; and

a pair of knobs, each having a threaded portion extending therefrom which are threadably receivable in said trunnion threaded openings, the diameter of said threaded portions being less than the width of said bracket slots whereby said knobs may be loosened with said threaded portions received in said trunnion openings and said bracket planar portions spread apart beyond the outer ends of said trunnions and the housing removed from the brackets by the threaded portions of said knobs passing through said slots.

4,480,810

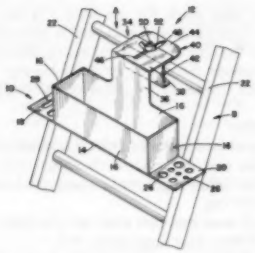
LADDER CADDY

Jeffrey J. Hall, 8479 Road 153, East Liberty, Ohio 43319

Filed Dec. 27, 1982, Ser. No. 453,717

Int. Cl.[3] E06C *7/14*

U.S. Cl. 248—238 **10 Claims**



1. A container and clamping device for a ladder comprising:

a container member configured for containing work implements, and including side edge portions comprising first and second outwardly extending panels adapted to engage ladder side rails;

a clamping member depending from said container member and including a first portion comprising a first support shoulder and a first support flange generally normally depending therefrom, and a second portion selectively adjustable to said first portion comprising a second support shoulder generally opposite of said first support shoulder and a second support flange generally normally depending from said second support shoulder; and,

means for selectively fastening said clamping member first portion to said clamping member second portion whereby said container and clamping device may be attached to a ladder.

4,480,811

FAIL-SAFE ACTUATOR DEVICE

Lorin P. Card, Sepulveda, and Otto W. Borsting, Long Beach, both of Calif., assignors to VSI Corporation, Pasadena, Calif.

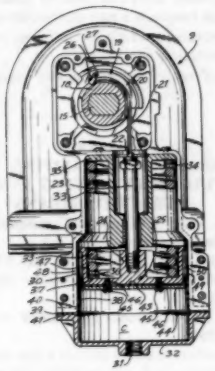
Continuation-in-part of Ser. No. 281,087, Jul. 7, 1981, Pat. No. 4,412,670. This application Aug. 24, 1983, Ser. No. 525,969

Int. Cl.[3] F16K *31/00*

U.S. Cl. 251—14 **4 Claims**

1. In a fail-safe apparatus of the type which comprises a housing defining a cylindrical bore having a port in one end, a piston member mounted for axial movement in said bore toward and away from said one end, between a charged limiting position whereat said piston is spaced a predetermined distance from said one end and a discharged limiting position whereat said piston lies adjacent to said one end, spring means in said bore and biased between said piston and the other end of said bore and urging said piston toward said one end, a flexible cable member operatively connected at one end to said piston member, a drive shaft mounted in said housing for

rotation about an axis normal to the axis of said bore, said shaft including a yoke having an outwardly open arcuate track concentric with the axis of said shaft, the other end of said cable member being secured to said yoke, said cable being arrayed in said track, the improvement which comprises said piston defining with said bore an annular clearance space, a rolling elastomeric diaphragm member mounted in said bore in the area between said one end and said piston, said diaphragm including an outer annular portion adapted to line said bore, an



inner annular portion extending into said clearance space and adapted to line the outer periphery of said piston, and a roll portion linking said inner and outer annular portions and disposed within said clearance space, an annulus surrounding said piston and movably mounted in said clearance space, said annulus including a stop face directed toward said one end of said bore, and spring means biased against said annulus and urging said stop face into engagement with said roll portion to prevent extrusion of said roll portion of said diaphragm away from said one end and through said clearance space.

4,480,812

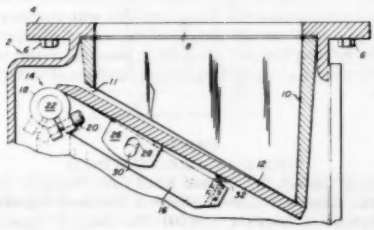
TRAP WITH REDUCED FORCE OPENING MEANS

Urgel R. Carpentier, Plattsburgh, N.Y., assignor to Plattsburgh Foundry, Inc., Plattsburgh, N.Y.

Continuation of Ser. No. 334,660, Dec. 28, 1981, abandoned, and a continuation-in-part of Ser. No. 112,332, Jan. 15, 1980, Pat. No. 4,308,894, and Ser. No. 112,333, Jan. 15, 1980, Pat. No. 4,307,747. This application Sep. 14, 1983, Ser. No. 531,629

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—87 **4 Claims**



1. In a dust trap defining a flow path axially generally vertically therethrough including a valve seat defining a central opening and having a peripheral seating surface thereon, a matching valve flap for covering said opening and seating upon said seating surface to close the valve, and means mounting said valve flap for pivotal movement between opening and closed positions including a rotatable shaft disposed laterally adjacent said opening and one edge of said flap, and an operating arm extending therefrom across a major portion of said flap,

the improvement therein comprising freely pivotable means connecting said arm to said valve flap in normally spaced relation thereto and at an eccentric location with respect to the center of said flap with said eccentric location disposed nearer one side of said seating surface toward said mounting means that to the side opposite therefrom,

a compression spring interposed between said flap and said arm adjacent the distal end thereof and on said flap opposite side,

thereby to provide a mechanical advantage in breaking the portion of said valve flap nearest said connection away from said valve seat and into contact with the said arm adjacent said mounting means to minimize dust collection thereat while the opposite side of said valve flap remains initial fulcrum contact with said valve seat.

4,480,813

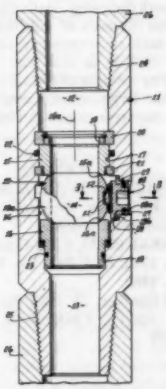
KELLY COCK ROTARY DRIVE MECHANISM

Patrick C. Holley, Lynwood, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Jul. 26, 1982, Ser. No. 400,431

Int. Cl.³ F16K *51/00*

U.S. Cl. 251—288 **21 Claims**



1. For use in rotating a valve stopper in a valve body forming flow passages at longitudinally opposite sides of the stopper to be brought into communication through the stopper when the stopper is rotated from closed to open positions, the body having a side opening, the combination comprising

(a) a sleeve adapted for reception in said side opening, the sleeve having retainer structure to interfit shoulder structure on the body for blocking rotation of the sleeve in the side opening,

(b) a crank received in the sleeve for rotation therein, thereby to rotate the valve stopper, and

(c) interengageable stop shoulder structure on the crank and sleeve to limit rotation of the crank and the stopper at stopper open and closed positions,

(e) said retainer structure including tang means projecting for reception in grooving in the body.

4,480,814

KEY FOR OPERATING BALL VALVES

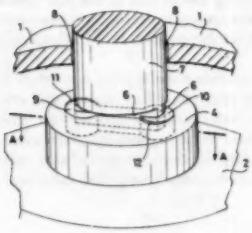
Costantino Vinciguerra, Florence, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

Filed Aug. 26, 1982, Ser. No. 411,845

Claims priority, application Italy, Sep. 2, 1981, 23731 A/81

Int. Cl.³ F16K *31/00*

U.S. Cl. 251—292 **2 Claims**



1. In a ball valve having a valve body with a bore therethrough, a rotatable ball in the body having a pivot in alignment with the bore, and a control stem extending through the bore of the body and into the pivot of the ball for rotation thereof, an improved interacting pivot and stem which distribute forces over relatively large contact areas to avoid the dangerous concentration of stresses comprising:

a seat in the pivot of the ball having an intermediate channel with opposing relatively large cylindrical cavities at the ends thereof, and

a key on the control stem insertable in said pivot and having an intermediate projection which corresponds to the configuration of said intermediate portion of said channel in said pivot with opposing relatively large cylindrical pieces fitted idly on the ends of said intermediate projection of said key which correspond to the configuration of said cylindrical cavities in said seats, whereupon the forces transmitted by rotation of the stem in the pivot are distributed over the large contact areas between said seat and said key as the stem causes the ball to rotate.

4,480,815

SEALING DEVICE FOR VALVES

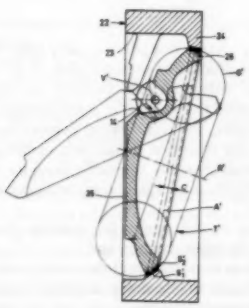
Sven E. Kreij, Linköping, Sweden, assignor to Saab-Scania Aktiebolag, Linköping, Sweden

PCT No. PCT/SE82/00130, § 371 Date Nov. 19, 1982, § 102(e) Date Nov. 19, 1982, PCT Pub. No. WO82/03899, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 23, 1982, Ser. No. 444,583

Int. Cl.³ F16K *15/03, 1/226*

U.S. Cl. 251—298 **4 Claims**



1. A valve comprising a body defining a valve seat lying substantially in a plane and through which a flow passage extends, and a valve member having a pivot axis parallel to said plane and spaced to one side thereof about which said valve member is swingable to and from a closed position wherein a peripheral sealing surface on said valve member is engaged with an opposing sealing surface on said valve seat, said valve being characterized by:

one of said sealing surfaces having the shape of a segment of the surface of a toroid generated by rotating a curved line, as a generatrix, about an axis of rotation, said segment being taken between a pair of parallel planes

(a) the normals to which are inclined with respect to said axis of rotation and

(b) each of which intersects said toroid all around the same.

4,480,816

APPARATUS FOR CLAMPING AND/OR LONGITUDINALLY MOVING AN ELONGATE TRACTION MEANS

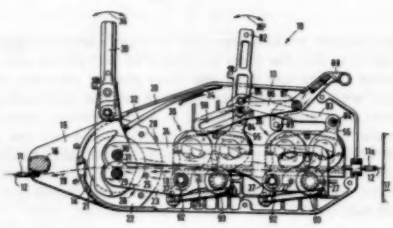
Guido Gortan, Itzig, Luxembourg, assignor to Secalt, S.A., Dumoulin, Luxembourg

Filed May 10, 1982, Ser. No. 376,936

Claims priority, application European Pat. Off., May 13, 1981, 81103685.4

Int. Cl.³ B66D *1/00*; B66F *1/02*

U.S. Cl. 254—264 **16 Claims**



1. In an apparatus for clamping and longitudinally moving an elongated traction means comprising at least one pair of clamping jaws comprising a first clamping jaw and a second clamping jaw on mutually opposite sides of said traction means and adapted to be moved in relation to one another transversely to said traction means; at least one clamping lever and at least one clamping key adapted to move said pair of clamping jaws into clamping engagement with said elongate traction means; the improvement comprising the side faces of said first clamping jaw being provided with grooves extending transversely to the longitudinal direction of said traction means and said second clamping jaw being provided with coupling studs fitted into bores on said flanges of the second clamping jaw thereby holding said pair of clamping jaws immovable in relation to one another in the longitudinal direction of said traction means.

4,480,817

SHOCK-ABSORBING WINCH

Yoshihiro Kosboji, Tokyo, and Kenji Sato, Maizuru, both of Japan, assignors to Director General, Technical Research and Development Institute, (TRDI) The Defence Agency and Hitachi Zosen Corporation, both of, Japan

Filed Feb. 14, 1983, Ser. No. 466,072

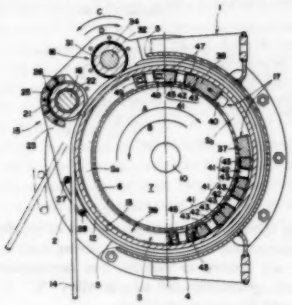
Claims priority, application Japan, Feb. 16, 1982, 57-24234

Int. Cl.³ B66D *1/00*

U.S. Cl. 254—332 **6 Claims**

1. A shock-absorbing winch comprising a drive shaft reversibly rotatable by a drive unit and having a cylindrical outer peripheral surface, a hollow winch drum surrounding the drive

shaft and forming a cylindrical space between the outer peripheral surface of the drive shaft and the inner peripheral surface of the drum, a first stopper fixed to the outer peripheral surface of the drive shaft at a suitable location in the circumferential direction thereof, a second stopper fixed to the inner peripheral surface of the winch drum at a suitable location in the circumferential direction thereof and dividing the cylindrical space into first and second circular arc compartments between the first and second stoppers, a first shock absorber disposed in the



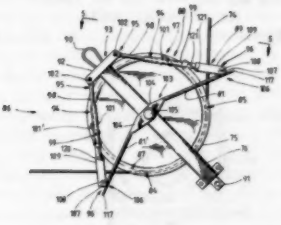
first compartment, and a second shock absorber disposed in the second compartment; wherein the first shock absorber comprises a plurality of elastic means each extending axially of the drive shaft and arranged circumferentially of the drive shaft, each of the elastic means is fixedly held between a pair of retainer bars spaced apart circumferentially of the drive shaft, and each of the retainer bars is provided with slide sheets spaced apart radially of the drive shaft and individually in contact with the outer peripheral surface of the drive shaft and the inner peripheral surface of the winch drum.

4,480,818

SAFETY ENHANCEMENT DEVICE FOR WELL-LOGGING CABLE SHEAVE WHEELS

Larry D. Frank, Kingwood, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Sep. 2, 1982, Ser. No. 414,151
Int. Cl.³ B66D *3/04*
U.S. Cl. 254—411 **4 Claims**



3. A safety enhancement device for a well logging cable sheave wheel rotatably mounted in a frame member, the sheave wheel having a pinch point located where the well logging cable first contacts the sheave wheel, comprising;

means for assisting in the prevention of foreign objects passing into the pinch point, whereby the foreign objects do not become disposed between the well logging cable and the sheave wheel;

first means for supporting the means for assisting in a position adjacent the pinch point;

said assisting in prevention means comprises at least one guard plate adjustable mounted with respect to the first support means; and

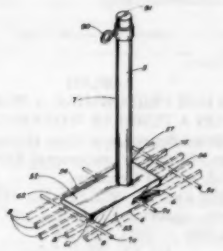
wherein the first support means includes at least one extendable member comprising an inner and an outer tubular arm with the inner tubular arm slidingly disposed within the outer tubular arm, and adjusting and locking means comprising a plurality of mating holes in said arms and a pin member adapted to be inserted in the mating holes.

4,480,819

ATTACHABLE/DETACHABLE RAILING DEVICE

Keith Lopez, 304-½ 4th St., Abbeville, La. 70510

Filed Jun. 23, 1982, Ser. No. 391,293
Int. Cl.³ E04H *17/00*
U.S. Cl. 256—1 **11 Claims**



1. An attachable protective railing device for engagement with grating, having cross members and run members for barricading an area which is desired to be protected, comprising:

(a) a plurality of posts disposed in surrounding relationship to the area to be protected, each said post having a vertically extending upper tubular portion, a channeled foot portion fixedly attached to said upper portion for slidably engaging said grating, said foot portion further comprising a top surface plate and a pair of skirts extending downwardly therefrom, each said skirt having a slot extending radially inwardly from one outer end thereof;

(b) barrier means interconnecting said posts.

4,480,820

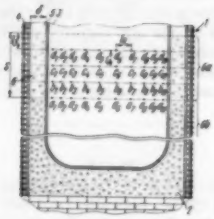
METHOD OF LINING METALLURGICAL ASSEMBLY

Leonid F. Zhukov; Evgeny G. Chugunny; Vladimir S. Shumikhin; Sergei V. Kucherenko, all of Kiev; Mechislav V. Zhelnis, and Pranas V. Zemlyavichus, both of Kaunas, all of U.S.S.R., assignors to Institut Problem Litia Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

PCT No. PCT/SU81/00031, § 371 Date Nov. 19, 1982, § 102(e) Date Nov. 19, 1982, PCT Pub. No. WO82/03451, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 31, 1981, Ser. No. 451,143
Int. Cl.³ F27D *1//16*
U.S. Cl. 266—44 **5 Claims**

1. A method of lining a metallurgical assembly, comprising steps of lining an assembly bottom, mounting a gauge for forming an inner wall of the assembly lining on the lined bottom, layer-by-layer filling a space provided between the gauge and a corresponding element of the assembly forming an outer wall of the lining, with a lining mass while compacting each layer, wherein the lining mass (6) is filled in layers each having a thickness of from 4 to 10 values of said space (5), and compaction of each layer is accomplished by applying periodically repeating blows against the inner surface of the gauge (3), the

direction of said blows being perpendicular to the plane tangential to this surface of the gauge (3), the blows being applied



with an interval which is not less than the damping time of free oscillations of the assembly (1).

4,480,821

APPARATUS FOR PERFORMING A WORK FUNCTION ON A TUBULAR WORKPIECE

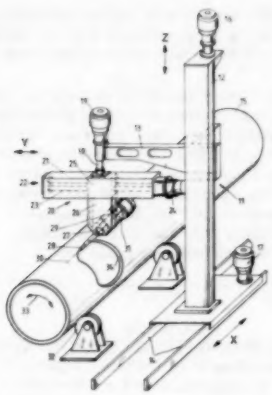
Hans Noll; Wilfried Bangert, and Hans Hacobs, all of Leverkusen, Fed. Rep. of Germany, assignors to Klöckner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Dec. 22, 1982, Ser. No. 452,314

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150971; Mar. 6, 1982, 3209439

Int. Cl.³ B23K *7/04*

U.S. Cl. 266—54 **12 Claims**



1. An apparatus for performing a work function on a tubular workpiece, comprising a support frame movable along a first axis lying parallel to the central axis of the workpiece, bracket means mounted on said frame for movement toward and away from the workpiece along a second axis lying perpendicular to said first axis, an elongated support arm mounted on said bracket means for movement about a swivel axis lying parallel to said second axis, carriage means mounted on said arm for movement therealong, a workpiece implement mounted on said carriage means for movement together therewith and for movement about a tilting axis lying parallel to said first axis, said implement having a forward end capable of being moved along a central axis of said implement toward and away from said support arm, said arm lying in a plane containing said swivel axis and perpendicular to said tilting axis, whereby independent axes are provided about which said implement may be adjusted relative to the workpiece.

4,480,822

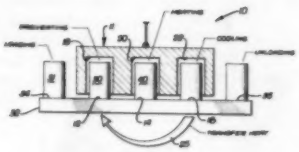
ANNEALING FURNACE SYSTEM

Luigi Mauratelli, Via Covetta 7, P.O. Box 85, 54031 Avenza MS, Italy

Division of Ser. No. 234,268, Feb. 13, 1981,. This application Jun. 9, 1982, Ser. No. 386,347

Int. Cl.³ F27D *1/00*

U.S. Cl. 266—256 **10 Claims**



1. An annealing furnace for annealing a series of articles that are subject to deformation from planarity during such annealing, such as but not limited to metallic flat laminations and especially magnetic-grain-oriented silicon alloy "C" or "E" electrical cores; said furnace comprising:

a preheating station for applying to each such article heat given off by cooling of a preceding such article in the series;

a heating station for applying to such article heat developed by such furnace;

a cooling station for directing heat from such article to preheat a succeeding such article in the series, and thereby to partially cool such article in the cooling station;

a movable transfer platform adapted to receive and support a plurality of such articles at defined positions on the platform and to move such articles through the preheating, heating, and cooling stations in sequence; and

a clamping mechanism carried on the transfer platform and adapted to forcibly clamp each such article while it is in at least the heating and cooling stations.

4,480,823

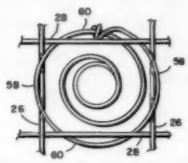
INNERSPRING ASSEMBLY FOR FURNITURE SEATS AND BACKS

Henry J. Marcinczyk, Oxford, and Ronald J. Gurcew, Southbridge, both of Mass., assignors to Webster Spring Co. Inc., Oxford, Mass.

Filed Sep. 30, 1982, Ser. No. 429,608

Int. Cl.³ A47C *23/053*

U.S. Cl. 267—91 **6 Claims**



1. An innerspring assembly for furniture seats and backs comprising spaced, parallel top and bottom grid frames and coiled springs interposed between the grid frames and secured thereto, said top grid frame comprising a border wire defining a rectangular frame and pairs of longitudinally and transversely-extending, right-angularly crossing anchoring wires secured at their ends to the border wire and to each other at their crossings, said crossing pairs of anchoring wires defining longitudinally and transversely-spaced, substantially rectangular seats for the top loops of the coils, said bottom grid frame

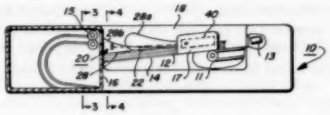
comprising a border wire defining a rectangular frame and transversely and longitudinally-extending, spaced, parallel anchoring wires welded at their ends to the border wire of the bottom grid frame and to each other at their crossings and so positioned on the bottom frame that their crossings define seats for the loops at the lower ends of the coils situated vertically below the centers of the seats defined by the anchoring wires of the top grid frame, said coils tapering from top to bottom and being positioned with the top loops in engagement with the seats at the top grid frame with two of their diametrically-opposed arcuate portions below the anchoring wires of the top grid frame and two above, with the bottom loops in engagement with the seats of the bottom grid frame with two of their diametrically-opposite portions above one of the wires of the seats of the bottom grid frame and with the two diametral portions at right angles thereto below the other of the wires of the seats of the bottom grid frame, wherein one of the anchoring wires on the grid frame contains deviations which extend downwardly through the bottom loops of the coils and having downwardly-converging sides held wedged within the bottom loops by the other of the crossing wires of the seats.

4,480,824

RESTACK JAM DETECTION

Thomas Acquaviva, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1982, Ser. No. 358,080
Int. Cl.³ B65H *1/30, 7/14*
U.S. Cl. 271—3.1 **6 Claims**



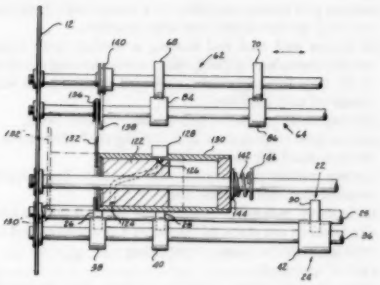
1. In a sheet handling apparatus in which flimsy sheets are stacked on top of a stack thereof in a generally horizontal stack support tray between generally vertically extending spaced apart side guide members by being fed in over the top of said stack from one end thereof and released to normally generally planarly stack on top of said stack, the improvement for detecting mis-stacking comprising: optical sensing means defining a sheet interruptable optical sensing path extending transversely above said stack positioned to be interrupted by mis-stacked non-planar sheets variously extending above said stack; sheet mis-stacking indicator means connected to be actuated by said optical sensing means by interruption of said optical sensing path; and timing means operatively connecting with said optical sensing means and said mis-stacking indicator means to prevent activation of said mis-stacking indicator means by brief interruptions of said optical sensing path from said normal stacking and to allow an activation of said mis-stacking indicator means by an interruption of said optical sensing path continuing for a preset time period indicative of the presence of a mis-stacked sheet; in which one said side guide member is fixed and the other said side guide member is repositionable to adjust to different sheet sizes, and wherein said optical sensing means comprises a fixed light beam emitter and light beam detector means closely associated with said fixed side guide member and a light reflector means on said repositionable side guide member for normally reflecting the light beam from said light beam emitter back to said light beam detector means to form said optical sensing path irrespective of the respositioning of said repositionable side guide member.

4,480,825

SHEET SET SEPARATOR FOR ELECTROPHOTOGRAPHIC COPIER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Filed Feb. 11, 1980, Ser. No. 120,474
Int. Cl.³ B65H *29/14, 33/06*
U.S. Cl. 271—81 **2 Claims**



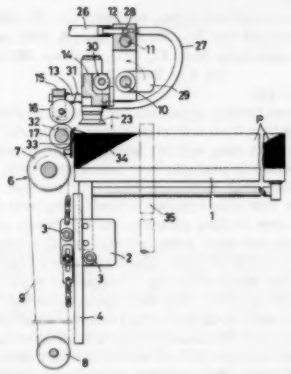
2. Apparatus for feeding sheets along a path and for delivering said sheets to a location having a lateral spacing with references to said path including in combination first sheet gripping means, second sheet gripping means located at a point spaced along the path from said first means, means for driving the first and second gripping means in such a direction and at such different speeds as to move said sheet along said path while producing a tension in said sheet between said first and second gripping means, means for sensing changes in the tension of said sheet between said first and second gripping means, and means responsive to said sensing means for shifting said second gripping means laterally to shift said sheet through a distance corresponding to said spacing.

4,480,826

PAPER FEEDER

Midori Kaneko, Sakai, Japan, assignor to Hamada Printing Press Mfg. Co., Ltd., Osaka, Japan

Filed Jul. 8, 1982, Ser. No. 396,481
Claims priority, application Japan, Mar. 11, 1982, 57-39889; Mar. 11, 1982, 57-35442[U]
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—103 **2 Claims**



1. A paper feeder for feeding blanks one after another, said paper feeder comprising:

a paper table vertically movable for supporting a stack of blanks,

a suction head provided over said paper table to be movable back and forth and having a cylinder,

said cylinder having a suction port for connection to a source of suction force and having a piston elevatably mounted and a spring means for urging said piston upwardly, said piston having a rod connected to its lower end,

a suction pad means, mounted to a lower end of said rod, for sucking up the blanks one after another,

said piston and said rod having a suction path extending axially therethrough and said rod also having a hole means in its wall for communicating said suction path with the inside of said cylinder,

a driving shaft provided behind said suction head,

a cam means, mounted on said driving shaft, for moving said suction head forwardly,

a spring means for urging said suction head backward toward said cam means, and

a table drive means for raising said paper table to keep the top level of the stack of blanks at a predetermined height, said table drive means comprising:

a pair of sprockets;

a chain or belt means running around said sprockets and connected to said paper table,

a dog clutch provided at one end of a shaft of one of said sprockets, said dog clutch having an input clutch which is not axially movable but rotatable with respect to said shaft,

a cam lever connected to said input clutch,

a one-way clutch means, provided between said cam lever and said input clutch, for coupling the cam lever and the input clutch together,

a cam means, fixedly mounted on said driving shaft, for rocking said cam lever,

said dog clutch transmitting the rocking motion of said cam lever to said shaft of one of the sprockets, thereby rotating it and thus raising said paper table,

a support bar means for extending transversely over said paper table so as to be rotatable,

a detection bar means, rockably connected to said support bar, for limiting the raising of said paper table, and

a crank arm and a link means for coupling said support bar means to said cam lever.

4,480,827

PIVOTAL FEED HEAD FOR PRINTING APPARATUS

Richard E. Shultz, Maitland, and William F. Voecks, Jr., Winter Park, both of Fla., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 445,566, Nov. 23, 1982, , which is a continuation of Ser. No. 240,898, Mar. 5, 1981, abandoned.

This application Mar. 31, 1983, Ser. No. 481,036

Int. Cl.³ B65H *7/08*

U.S. Cl. 271—111 **5 Claims**

1. Sheet item feeding apparatus for feeding individual sheet items one at a time from a sheet item support member provided with spaced apart item support lands, at high speed, without collision, overlap or multiple item jams comprising:

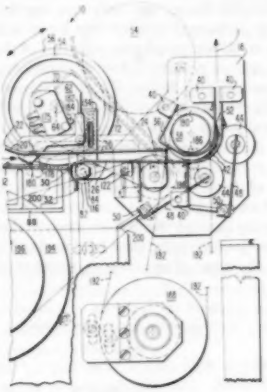
a single cantilever mounted, relatively narrow, but large diameter item feed member centrally disposed relative to a sheet item feeding pathway, said pathway comprising oppositely disposed, relatively flat, parallel, spaced apart members in and through which said sheet items are fed;

said item feed member having a reasonably high coefficient of friction relative to the sheet items to be fed,

a relatively wide sheet item retard member small in diameter relative to said feed member operably associated with said item feed member and in surface contact therewith, the large diameter feed member providing a relatively flat, shallow entering angle of feed for said items between said item feed member and said retard member,

oppositely disposed means operably interengaging said oppositely disposed parallel spaced apart members for applying a normal force through said retard member to said feed member relative to said items,

means disposed on one of said parallel members movable relative thereto and directly coupled to said retard member for applying a frictional torque force to said rotated member,



signal actuated means operably connected to said item feed member for incrementally rotatably moving said member so as to cause a single item to be fed in response to an applied electrical signal, and

means mounting said feeding apparatus including said item feed member, said retard member and spaced apart parallel members for pivotal, rockable movement into and out of the item feeding path permitting depleted items to be replenished from a new supply of sheet items.

4,480,828

MUTED RHYTHM INDICATING EXERCISERS

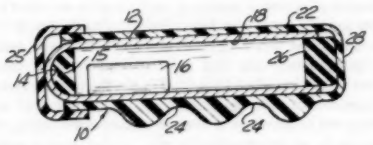
Harry P. Kifferstein, 27250 Harvard Rd., Southfield, Mich. 48076

Continuation-in-part of Ser. No. 180,840, Aug. 25, 1980, Pat. No. 4,366,956, which is a continuation of Ser. No. 51,113, Jun. 22, 1979, Pat. No. 4,278,248. This application May 10, 1982, Ser. No. 376,249

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—70 **24 Claims**



1. An exercising device comprising an elongated circularly cylindrical tubular member of a convenient diameter and length to be gripped by a hand, a longitudinal bore of substantially constant diameter extending from end to end within said elongated tubular member, a freely movable single-piece weighted mass within said bore adapted to be displaceable from end to end therein, said single-piece weighted mass having at least one dimension greater than one-half the diameter of said elongated tubular member, and a pair of closure walls,

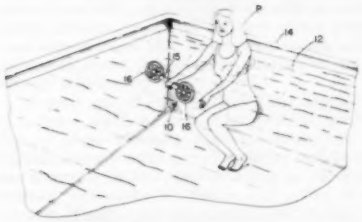
each of said closure walls being disposed at an end of said bore and having a surfce for impacting by an end surface of said single-piece weighted mass, wherein at least one of the surfaces in mutual engagement upon impact by said single-piece weighted mass with said closure wall is made of an elastomeric material for emitting a single muted sound upon impact shock of said weighted mass with a closure wall and the length of said tubular member is less than about 160 mm.

4,480,829

AQUATIC EXERCISING AND BODY TONING DEVICE

Anton Yacoboski, Squamish, Canada, assignor to Aquatic Exercise Products, Inc., San Rafael, Calif.

Filed May 18, 1983, Ser. No. 495,745
Int. Cl.³ A63B *11/00*
U.S. Cl. 272—116 **2 Claims**



1. An exercising device for use by a person who is positioned in water comprising:

a handle to be gripped by said person;

relatively flat, generally co-planar panels fixed to the ends of said handle, each with a generally circular surface area to resist movement thereof through water;

each said panel including a pair of relatively rigid, coaxial discs in face to face engagement;

each of said discs having a hub and an outer ring;

sector spoke members radiating outwardly from said hub at equal angles to each other connecting said hub to said outer ring thereby forming sector openings in said discs;

means for rotating one of said discs relative to the other so as to vary the registration of sector openings in one of said discs with openings in the other thereof so as to adjust the degree of resistance to movement of each of said panels through water; and

means for releasably securing said one disc in a selected one of a plurality of positions relative to the other so that the relative degree of resistance thereof to said movement is visually indicated and can quickly be varied;

said handle being conditioned to be gripped at any location around the periphery thereof so that said panels can be moved through water in any plane from parallel thereto to normal thereto, further to vary their resistance to movement of said panels through water.

4,480,830

METHOD AND APPARATUS FOR EXERCISING

Jerrold S. Petrofsky, Beavercreek; Roger M. Glaser, Dayton, both of Ohio; Steven H. Petrofsky, Florissant, Mo., and Harry H. Heaton, III, Beavercreek, Ohio, assignors to Wright State University, Dayton, Ohio

Filed Sep. 14, 1982, Ser. No. 417,935
Int. Cl.³ A63B *21/12*
U.S. Cl. 272—117 **12 Claims**

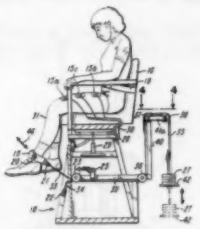
1. Method of exercising a human muscle comprising the steps of:

(1) attaching a plurality of transcutaneous stimulators to the skin of said human in a pattern above said muscle,

(2) applying to said stimulators a plurality of stimulation signals having profiles for causing said muscle to contract and produce movement of a limb connected thereto,

(3) applying a resisting force to said limb for causing exertion of said muscle during said movement,

(4) sensing said movement and generating a feedback signal corresponding thereto,



(5) monitoring said feedback signal to determine when a predetermined response has been achieved,

(6) after said predetermined response has been achieved, altering said stimulation and permitting said muscle to relax, and

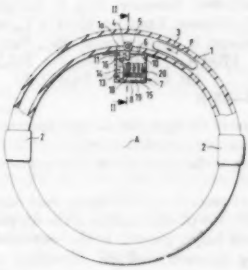
(7) repeating aforesaid steps to produce an exercise routine.

4,480,831

EXERCISE HOOP HAVING A COUNTER

Friedhelm Müller-Deinhardt, Breslauer Strasse 19, 3006 Burgwedel 1, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,584
Int. Cl.³ A63B *19/00, 23/02*
U.S. Cl. 272—128 **14 Claims**



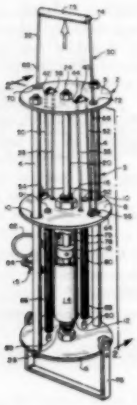
1. In an exercise device characterized by a hoop having a circumference, a hollow passage and a circulating weight in the hollow passage, the circulating weight being capable of travelling through the hollow passage around the circumference of the hoop upon rhythmic rotation of the hoop, the improvement in combination therewith comprising, a counter means capable of counting the revolutions of the circulating weight around the circumference of the hoop and a speed sensor means capable of measuring the speed of the circulating weight.

4,480,832

EXERCISING APPARATUS

Robert Bulmash, 29 W. 382 White Oak, Warrenville, Ill. 60555, and Ernest H. Medley, Sr., 803 Cambridge, Elmhurst, Ill. 60126

Filed Sep. 30, 1982, Ser. No. 428,572
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—130 **9 Claims**



1. An exercising device comprising a pair of spaced fixedly interconnected end members and an intervening hydraulic resistance operative between said end members including a piston rod connected to said end members, and a cylinder slidable on said rod between the ends thereof and means for transferring fluid from one end of the cylinder to the other pursuant to movement of said cylinder on the rod, means for anchoring said device, and operating means for manipulating said cylinder by the user pursuant to performing exercising movements and said operating means comprises a pulley and cord mechanism reactively connected between said cylinder and one of said end members and having handhold means for grasping by the user and pulling on the same.

4,480,833

AMUSEMENT GAME

David M. Barcelow, Kenmore; John R. Callahan, Buffalo, and Michael T. Johnson, Kenmore, all of N.Y., assignors to Innovative Concepts in Entertainment, Inc., New York, N.Y.

Filed Apr. 7, 1982, Ser. No. 366,342
Int. Cl.³ A63F *7/06, 7/30*
U.S. Cl. 273—85 B **11 Claims**

1. In a game of the type simulating a spectator sport wherein player elements are operated to move a player piece along and over a playing surface into either of two scoring areas to result in a score:

(a) first and second sensing means each operatively associated with one of said scoring areas for providing a signal when said player piece is in the respective scoring area;

(b) scoring means operatively connected to said first and second sensing means for converting signals from said sensing means into scores associated with players of said game;

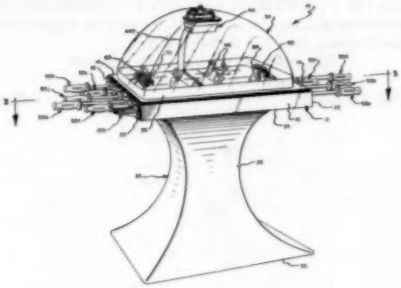
(c) time indicating display means having a first state indicating regular playing time for the game, a second state indicating a near-end condition of the game playing time, and a third state indicating an overtime condition of the game playing time;

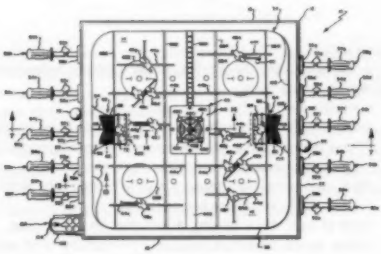
(d) timing means operatively connected to said time indicating display means for controlling the duration of said first state and for causing switching to said second state;

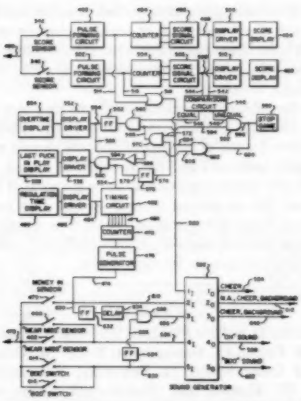
(e) score monitoring and comparing means operatively connected to said scoring means and to said timing means for providing during said second state a first output signal indicating inequality of said scores and a second output signal indicating equality of said score;

(f) means operatively connected to said score monitoring and comparing means for utilizing said first output signal to cause stoppage of said game; and

(g) means operatively connected to said score monitoring and comparing means and operatively connected to said







time indicating display means for utilizing said second output signal to switch and display means to said third state.

2. A coin operated game apparatus of the type simulating a spectator sport, comprising:

a playing surface, a plurality of player elements located above and moveable relative to said playing surface, a playing element moveable relative to said playing surface upon movement of said player elements, a goal area hav-

ing an opening communicating with a passage receiving said playing element resulting in a score, a first electrical sensing means sensing the receipt of said playing element in said goal opening, a clear plastic dome enclosing and hermetically sealing said playing surface, a score indicating electrical display means within said dome and spaced from said player elements, said first sensing means connected to the input of said score indicating display means for displaying the number of goals scored upon receipt of said playing element in said goal opening, a playing element ejector means receiving said playing element from said goal opening and passage adapted to eject said playing element onto said playing surface, spaced from said goal opening and within said hermetically sealed dome, said dome thereby preventing access by the players of said game apparatus to said player and playing elements, a sound generating means, and a second electrical sensing means located adjacent said goal opening connected to the input of said sound generating means, said second sensing means adapted to sense the presence of said playing element adjacent said goal opening and actuate said sound generating means, indicating the presence of said playing element adjacent said goal opening.

7. A preprogrammed coin operated game apparatus, comprising: a frame, a playing surface supported on said frame, a plurality of player elements supported above said playing surface and moveable relative to said playing surface, a playing element moveable on said playing surface in response to the movement of said player elements, a goal having an opening communicating with a passage receiving said playing element resulting in a score, a clear plastic dome enclosing and hermetically sealing said playing surface, a plurality of manual control means extending from said frame connected to said player elements and adapted to move said player elements relative to said playing surface, a game apparatus control circuit means, an ejector means receiving said playing elements froms said goal opening and passage, said ejector means ejecting said playing element onto said playing surface spaced from said goal opening upon actuation of said control circuit means to start the operation of said game apparatus, an audio generating means, a coin operated actuation delay circuit connected to the input of said audio generating means, said delay circuit adapted to actuate said audio generating means to provide an initial audio transmission upon receipt of a coin, and a manually actuated priority switch connecting said actuation delay circuit to said game apparatus control circuit means to override said delay circuit, stop said initial audio transmission and actuate said ejector means to eject said playing element onto said playing surface and begin the play of said game apparatus.

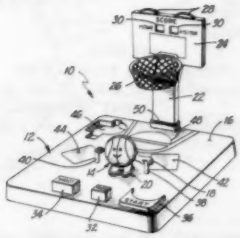
11. A coin operated hockey game apparatus, comprising: a frame, a rectangular generally flat playing surface supported on said frame, a plurality of hockey figures supported above said playing surface and moveable relative to said playing surface, a hockey puck-like playing element on said playing surface moveable relative to said playing surface upon engagement by one of said playing figures, each of said playing figures including a hockey stick extending from said figure including an end portion extending generally parallel to said playing surface, goals at opposite ends of said playing surface each having an opening receiving said playing element, an electical control circuit means including sensing means and score indicating sensing the scoring of a goal and indicating the score, a clear plastic dome enclosing and hermetically sealing said playing surface having a top surface spaced from said hockey playing figures, a plurality of manual control means extending from said frame connected to said hockey playing figures and adapted to move said playing figures relative to said playing surface, said playing surface including inclined ramp surfaces adjacent to opposed corners of said playing surface maintaining said playing element on said playing surface for engagement by said figures, said hockey stick end portion of said hockey figures adjacent said ramp surfaces having a length sufficient to engage said ramp surfaces and said hockey figures adjacent to corners of said playing surface opposite said two opposed corners each having a hockey stick end portion longer than the end portions of said hockey figures adjacent said ramp surfaces permitting said figures to engage a playing element at said opposite playing surface corners.

4,480,834

TOY HAVING MOMENTUM IMPARTING SURFACE

Koichi Minami, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan

Filed Oct. 6, 1982, Ser. No. 433,031
Int. Cl.³ A63F 7/06; A63H 11/06
U.S. Cl. 273—85 E **8 Claims**



1. A toy which comprises:

a base having a surface, said surface including at least one movable portion, said movable portion movable at least upwardly from the remainder of said surface;

target means mounted on said base and having a target portion thereof located above said surface;

a self-propelled object associatable with said surface, said object including motor means, said object having a body section and a pedestal section, said pedestal section movably mounted to said body and moved with respect to said body section by said motor means, said object capable of moving across a support surface by moving said pedestal section with respect to said body section;

moving means associated with said movable portion of said surface for moving said portion, said moving means in moving said portion capable of imparting sufficient momentum to said portion such that if said object is located on said portion as said portion is moved said momentum is transferred to said object propelling said object upwardly off of said portion of said surface toward said target portion of said target means;

said object further includes an engagement means and said base includes an engagable means, engagement of said engagement means with said engagable means causing said object as it moves to pivot on said surface about said engagable means.

4,480,835

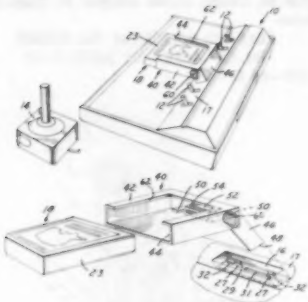
CARTRIDGE ADAPTER FOR PROGRAMMABLE VIDEO GAMES

Theodore R. Williams, 1927 Clifton, Royal Oak, Mich. 48073

Filed Mar. 2, 1983, Ser. No. 471,329
Int. Cl.³ A63B 71/04
U.S. Cl. 273—148 B **5 Claims**

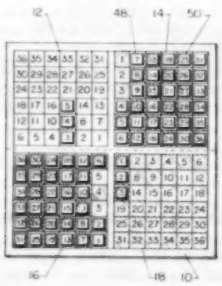
1. In a programmable video controller which includes a console adapted for connection to a video display and a program cartridge adapted to be removably affixed to said console for programming said console, said console having an opening adapted to receive said cartridge and a first connector of predetermined polarity disposed within said console, said cartridge having a predetermined configuration adapted to be inserted into said opening and having a second connector disposed within said cartridge of opposite polarity to said first connector for mating engagement therewith when said cartridge is inserted into said console opening,

means adapted for removably coupling said cartridge to said console comprising a hollow shell having an open first end contoured to internally receive a said cartridge and a second end contoured to be internally received within said console opening, first connection means identical to said second connector and disposed within said shell for mat-



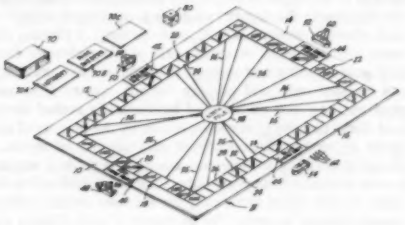
ing engagement with said first connector within said cartridge when a said cartridge is received within said shell, and second connection means within said shell electrically connected to said first connection means and identical to said first connector for mating engagement with said second connector within said console when said second end of said shell is received into said console opening.

4,480,836
BOARD GAME
Helmut A. Regis, P.O. Box 43, Station "S" , Toronto, Ontario, M5M 1L6, Canada
Filed Jun. 6, 1983, Ser. No. 501,446
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—248 **11 Claims**



1. A game apparatus comprising the combination of a game board having four large squares each divided into a number of small numbered squares of equal size, the large squares being of equal size and having the same number of small squares, two of said large squares being checkered and the other two being of uniform but different colours, a first set of game pieces of a first colour numbered from one to a number equal to the number of small squares in each large square, a second set of game pieces of a second colour numbered from one to the same number as said first set, and means for randomly determining the number of moves to which a player is entitled.

4,480,837
MARITIME GAME
Kerry L. Poirier, Box 2145, Columbia Falls, Mont. 59912
Filed Jan. 26, 1983, Ser. No. 461,121
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—252 **18 Claims**



1. A maritime game board apparatus comprising; a game board having a closed circuit, single path cruise route which passes a series of home ports for respective competing ship/-markers and includes a number of event positions, certain of which are labeled as "missile" positions, certain of which are labeled as "card" positions, and certain of which are blank; missile flight path lines each extending from a "missile" position on one side of the cruise route to a blank position on the opposite side of the cruise route; a controlled probability random number generator to determine the number of cruise course positions a given ship marker is moved during a given turn of play; competing ship/markers which are moved from position to position along the cruise route in the play of the game; removable cargo units carried by each of the ship/-marker; and a group of event cards, certain of which are labeled "intercept" and certain of which are left blank, the play of the game involving possible removal of a cargo unit from a ship/marker occupying a blank position at such time as another ship/marker occupies a "missile" position connected by a missile flight path line between such "missile" position and the occupied blank position, and the play of the game further involving the avoidance of the loss of a cargo unit by the ship/marker occupying the blank position and the owner of such ship/marker is the holder of and returns an "intercept" card.

4,480,838
FAMILY FINANCIAL BOARD GAME
Aharon G. Aharonian, P.O. Box 67, Shrewsbury, Mass. 01545
Filed Aug. 4, 1983, Ser. No. 520,176
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—256 **5 Claims**

1. Game apparatus comprising

(a) a game board having an inner path disposed within an outer path, one of those paths having a sequence of divisions in which each division represents a period of a life-cycle beginning with birth, the other of those paths being endless and having at least one sequence of contiguous blocks in which each block represents a real estate or other property,

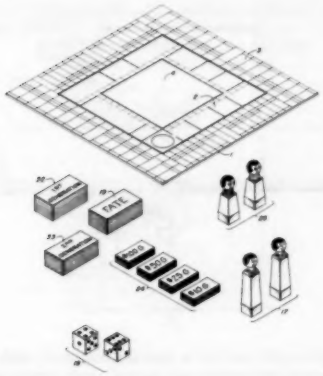
(b) a plurality of 1st generation cards, each card identifying parents and their income,

(c) a plurality of 2nd generation cards, each card specifying a vocation or profession, at least one level of education, and the salary or income for that level,

(d) a plurality of fate cards, each card specifying a benefit or a penalty,

(e) a plurality of chromosome dice, one die having on at least one face a symbol representing a female chromosome, the other die having a symbol representing a male chromosome on at least one face and the symbol representing the female chromosome on at least one other of its faces,

(f) a plurality of tokens, each token representing a player and being movable along the life-cycle track, and



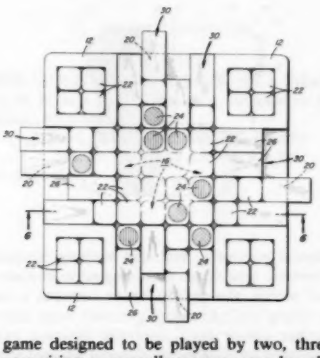
(g) a plurality of pieces, each piece representing a family and being movable along the endless path.

4,480,839

BOARD BLOCKS WITH PIECES MOVED BY INTERCONNECTED END BLOCKS

James B. Waters, Jr., 346 Summit Ave. Apt. 202, Gaithersburg, Md. 20877

Filed Jul. 8, 1982, Ser. No. 396,493
Int. Cl.³ A63F *3/00, 9/14*
U.S. Cl. 273—258 **10 Claims**



1. A game designed to be played by two, three or four players comprising: a generally square, game board base having home positions on the four sides thereof usable by a predetermined number of players in the range of from two to four; raised corner platform means at the four corners of said base defining a generally crossed shaped playing surface therebetween which includes a first, central, generally square shaped playing surface area and four playing surface extensions located between adjacent pairs of the four corner platform means; a plurality of substantially square and identical, movable game pieces, the total number of playing pieces being determined by the formula X^2+4X, X being 2 or a greater whole number, the X^2 quantity of pieces being located, initially, in said first surface and the 4X quantity of pieces being located in said playing surface extensions, adjacent said first area, an X quantity in each of the four surface extensions, a predetermined quantity of said game pieces being marked, the total number of pieces so marked being in the range of from 2 to 2X when there are two players, 3 to 3X when there are three players and 4 to 4X when there are four players; and a plurality of pairs of movable, end block members located in the four surface extensions, outside of, but abutting the game pieces located therein, the number of said pairs of end blocks being 2X, each pair of end blocks being arranged linearly across from one another on said base, embracing a quantity of X+2 game pieces therebetween and being fixedly interconnected to one another beneath said game pieces and thus being movable as a playing unit on said base, the unit including the end blocks with game pieces linearly embraced therebetween; units arranged at 90 degrees to one another being movable across one another whereby game pieces may be moved laterally and linearly across said playing surface from one side to the other to thereby play a game.

4,480,840

MULTI-SUIT CARD GAME

Yin-Jenn Chang, No. 29, Alley 16, Sun-Kuang Lane, Pei-Tuen District, Tai Chung City, Taiwan

Filed Nov. 2, 1982, Ser. No. 438,705
Int. Cl.³ A63F *1/00*
U.S. Cl. 273—292 **3 Claims**

Classification	Celestial			Terrestrial Cards		
Suit Cards	Sun	Moon	Star	Club	Bamboo	Pine
Pattern	○	☽	☆	❀	𝍐	🌲
Color	Red	Green	Black	Red	Green	Black
Figure Cards				A	A	A
				2	2	2
	3	3	3	3	3	3
	4	4	4	4	4	4
	5	5	5	5	5	5
	6	6	6	6	6	6
	7	7	7	7	7	7
	8	8	8			
	9	9	9			
Face Card	R	R	R	R	R	R
	O	O	O	O	O	O
	C	C	C	C	C	C

1. A multi-suit card game, comprising:

a total of sixty cards divided into three color groups, with twenty cards in each color group, wherein

within each color group, then cards are designated as "Celestial cards" with the designations respectively "3,4,5,6,7,8,9,R,O,C", and the remaining ten cards within each color group are designated as "Terrestrial cards" with the respective designations "A,2,3,4,5,6,7,R,O,C", wherein

said Celestial cards represents respectively the sun, moon and stars by the respective color groups, and said Terrestrial cards represent respectively clubs, bamboo, and pine by the respective color groups.

4,480,841

APPARATUS AND METHOD FOR SEALING A TUBE JOINT

Glen E. Schukei, South Windsor; Frank J. Formanek, West Suffield, and Donald V. Graf, Simsbury, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 13, 1982, Ser. No. 434,092
Int. Cl.³ F16J *15/08;* **F16L** *33/11*
U.S. Cl. 277—1 **10 Claims**

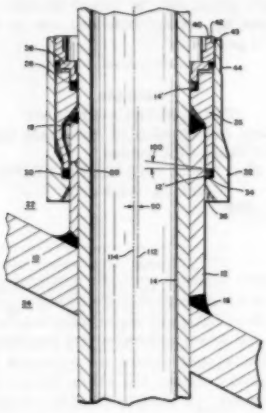
1. Apparatus for sealing a joint between substantially collinear first and second tubes, comprising:

a sleeve of cylindrical shape, having a lower end fitting closely around said first tube and an upper end fitting

closely around said second tube, for surrounding the portion of said joint to be sealed;

a cylindrical housing fitting closely over the exterior of the lower end of the sleeve and extending upwardly over the upper end of the sleeve and having an inner, annular lip disposed adjacent the lower end of the housing;

a lower packing ring, disposed between the lower end of the sleeve and the housing lip for forming a seal between the sleeve and said first tube;



a thrust ring fitting closely between the interior of the upper end of the housing and said second tube;

an upper packing ring disposed between the upper end of the sleeve and the thrust ring, for forming a seal between the sleeve and said second tube; and

means, cooperating with the housing, for urging the thrust ring against the upper packing ring and the housing lip against the lower packing ring, whereby both packing rings are compressed against the sleeve and form a seal about said joint.

4,480,842

SELF-ALIGNING STUFFING BOX

Anil Mahyera, 1730 Harvard Ave., Salt Lake City, Utah 84108; Robert M. Sweet, 1578 W. 11745 So., Riverton, Utah 84065, and Carel J. H. Brest Van Kempen, 4920 Emigration Cyn., Salt Lake City, Utah 84108

Filed Jun. 27, 1983, Ser. No. 507,863

Int. Cl.[3] **F16J** *15/18, 15/40*

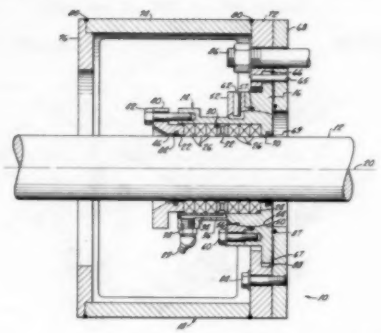
U.S. Cl. 277—22 **13 Claims**

1. A self-aligning stuffing box for a drilling device having a rotatable drill shaft comprising:

a packing gland including means defining an opening therethrough sized for passage of the rotatable drill shaft, said packing gland being configured for receiving packing ring means for forming a seal between the packing gland and the rotatable drill shaft, said packing gland further including means defining an exterior spherical surface thereon;

a socket having means defining an interior spherical surface thereon for engaging said packing gland exterior spherical surface in a ball-and-socket like manner to enable the packing gland, packing ring means and the rotatable drill shaft to pivot about the longitudinal axis of the rotatable drill shaft; and

frame means for slidably supporting the socket and for enabling the socket, packing gland, packing ring means and



rotatable drill shaft to be laterally displaced, with respect to the longitudinal axis of the drill shaft, as a single unit.

4,480,843

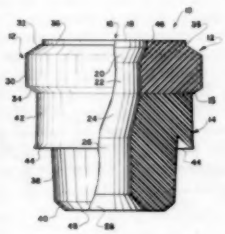
POLYMERIC ANNULAR SNUBBING APPARATUS

Virgil E. Springer; John J. Garner, both of Corsicana, Tex., assignor to Regal International, Inc., Corsicana, Tex.

Filed Oct. 12, 1983, Ser. No. 541,169

Int. Cl.[3] **F16J** *15/10;* **F16C** *29/00*

U.S. Cl. 277—31 **18 Claims**



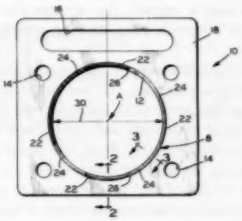
1. An annular polymeric snubbing element comprising an annular polymeric sealing member adapted to contain a pressurized fluid within the annular space between a string of production tubing and the casing in a well bore, said sealing member further comprising a centrally disposed axial bore further comprising an elastomeric material adapted to provide frictional engagement between said sealing member and said production tubing, and a circumferentially disposed, outward facing elastomeric sealing web adapted to provide pressure containing sealing engagement against the interior wall of said casing; and an annular polymeric support member adapted for use in maintaining said snubbing element in a desired positional alignment with respect to said well bore, said annular polymeric support member comprising a centrally disposed axial bore having a diameter at least as great as that of said polymeric sealing member; said annular polymeric support member comprising a polymeric material having a hardness greater than that of said annular polymeric sealing member; said annular polymeric sealing member and said annular polymeric support member being interconnected in such manner that one end of said annular polymeric sealing member is substantially coextensive with the adjacent end of said annular polymeric support member.

4,480,844

CYLINDER HEAD GASKET WITH VARIABLE THICKNESS FIRE RING

Richard J. Kozerski, Lisle, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 20, 1982, Ser. No. 450,855
Int. Cl.³ F16J *15/06*
U.S. Cl. 277—235 B **11 Claims**



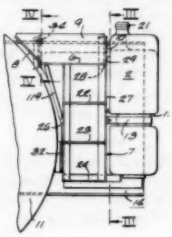
1. In a cylinder head gasket comprising a flat body including at least one cylinder aperture, said aperture having a generally circular boundary, at least one bolt aperture adjacent to said cylinder aperture, and wherein a fire ring is radially affixed to the boundary of said cylinder aperture; an improvement comprising the body of said ring having a cross section, said cross section having an axially extending dimension which is variable as a function of the proximity of said cross section to said one bolt aperture.

4,480,845

SIDE MOUNTED FUEL TANK ON A TRACTOR

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Jan. 3, 1983, Ser. No. 455,012
Int. Cl.³ B60K *15/02*; B60R *3/00*
U.S. Cl. 280—5 A **16 Claims**



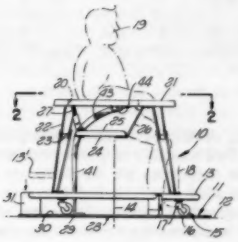
1. A fuel tank means on a vehicle comprising, a vehicle chassis, a fuel tank, a fuel tank rest for supporting the base of said fuel tank, a cantilever beam extending from said chassis over said fuel tank, a step suspended from said cantilever beam supporting said fuel tank rest and including a plurality of vertically spaced foot rests providing access to the vehicle operator station, a fuel tank reinforcing means confining said fuel tank to a predetermined shape and location, means defining a foot rest on the top of said step of larger size than preceding foot rests on said step, and a protective wall flaring outwardly from said large foot rest defining a partial fender adjacent a rotating wheel.

4,480,846

BASE PANEL RETAINING BABY WALKER AGAINST MOVEMENT

Gilbert A. Sanchez, 1411 Mitchell Pl., Los Angeles, Calif. 90033

Continuation-in-part of Ser. No. 404,644, Aug. 2, 1982, abandoned. This application Apr. 20, 1983, Ser. No. 486,568
Int. Cl.³ B62M *1/00*
U.S. Cl. 280—87.02 W **15 Claims**



4. For use with a baby walker having wheels for engaging a floor surface and moving therealong, and including a structure supported by said wheels for movement therewith and adapted to assist in supporting a baby in a position in which his feet can contact the floor surface and propel the walker therealong on said wheels, a device for preventing movement of said walker comprising:

a base panel adapted to be removably received in a position in which it is supported on the floor surface independently of said wheels of the walker and extends generally horizontally beneath a baby supported by said structure at a location to be contacted by the feet of the baby above the floor surface and prevent his feet from engaging the floor in propelling relation;

said panel being essentially circular and receivable within an essentially circular frame of the walker in a relation retaining the walker against horizontal movement relative to the panel.

6. For use with a baby walker having wheels for engaging a floor surface and moving therealong, and including a structure supported by said wheels for movement therewith and adapted to assist in supporting a baby in a position in which his feet can contact the floor surface and propel the walker therealong on said wheels, a device for preventing movement of said walker comprising:

a base panel adapted to be removably received in a position in which it is supported on the floor surface independently of said wheels of the walker and extends generally horizontally beneath a baby supported by said structure at a location to be contacted by the feet of the baby above the floor surface and prevent his feet from engaging the floor in propelling relation;

said panel having means engageable with said walker in a relation retaining the walker against horizontal movement relative to the panel;

said structure of the walker including a bottom frame extending between and connecting said wheels near the floor surface;

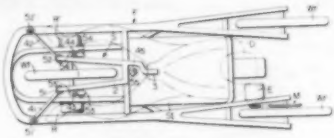
said means forming upwardly facing recesses on said panel for removably receiving said frame at spaced locations in an interfitting relation preventing horizontal movement of the walker relative to said panel.

4,480,847

STEERING DEVICE FOR VEHICLE

Kazuo Oyama, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1982, Ser. No. 417,348
Claims priority, application Japan, Sep. 14, 1981, 56-145019
Int. Cl.³ B62K *21/00*
U.S. Cl. 280—270 **3 Claims**



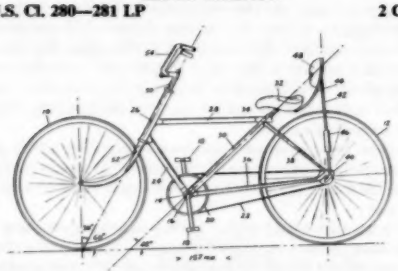
1. A steering device for a vehicle, comprising a steerable wheel, a front fork rotatably supporting the steerable wheel, a link mechanism supporting the front fork on a frame of the vehicle so as to allow said front fork to rotate with respect to a given steering axis of said steering wheel while restricting other motions, and a steering member connected to said front fork, said link mechanism including a pair of first links arranged so that the extensions of their respective axes intersect said given steering axis, and three second links arranged so as to allow said front fork to rotate with respect to said steering axis in cooperation with these first links while restricting the other motions.

4,480,848

BICYCLE

Georgi D. Georgiev, 194a Royal York Rd., Etobicoke, Ontario M8V 2V6, Canada

Filed May 2, 1983, Ser. No. 490,781
Int. Cl.³ B62K *3/14*
U.S. Cl. 280—281 LP **2 Claims**



1. A bicycle having front and back wheels, pedal crank and transmission means connected to the back wheel, whereby muscle power can be applied to the back wheel, a steering column housing at the front of such frame, a steering column rotatively mounted in said housing, and front wheel forks attached to said steering column for supporting a front wheel, a lower front frame piece extending between said steering column housing and said pedal crank, a lower rear frame member extending rearwardly from said pedal crank for supporting said back wheel, a saddle support column extending upwardly and rearwardly from said pedal crank, and a saddle post extending upwardly from said saddle support column, an upper rear frame member extending from the termination of said lower rear frame member extending from the termination of said lower rear frame member to said saddle support column, and an upper front frame member extending from said saddle support column to said steering column housing, and wherein the improvement comprises that;

said pedal crank is displaced forwardly of the centre of said back wheel by a distance equal to at least twice the radius of said back wheel,

and that said lower rear frame member has a length equal to at least twice the radius of said back wheel,

and that said steering column housing is slanted at an angle of between 62° and 58° to the horizontal,

and that said saddle support column has a length equal to between 1.2 and 1.4 times the radius of said back wheel, and terminates at an upper end located approximately perpendicularly above the intersection between said lower rear frame member, and the periphery of said back wheel,

and that said saddle support column is slanted at a lesser angle than said steering column housing of between 40° and 44° to the horizontal, whereby extension of said saddle post from said saddle support column will displace the saddle rearwardly away from said pedal crank and from said steering column housing while minimizing the increase in height of said saddle from the ground,

and that said back wheel and said front wheel are of the same diameter, and wherein said front wheel forks have lower end portions which are curved forwardly, with said front wheel located at the forward terminal points of said front forks, said curved portion of said front forks being of such length that a perpendicular line through the hub of said front wheel will intersect the axis of said steering column at about the point where said front wheel touches the ground,

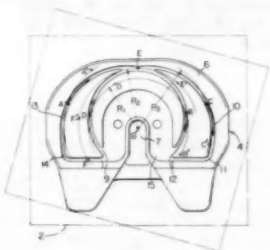
and including back rest means extending upwardly behind said saddle, and adjustable support means for said back rest means.

4,480,849

WHEEL PLATE

Mitsuru Yano, Fukuoka, and Akira Inoue, Kitakyushu, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,660
Claims priority, application Japan, Aug. 26, 1981, 56-133746
Int. Cl.³ B62D *53/08*
U.S. Cl. 280—433 **5 Claims**



1. A wheel plate of a coupler for use in coupling a tractor and trailer, the wheel plate being adapted to be mounted on the tractor and including a sliding surface adapted to be brought into engagement with an upper plate secured to a lower side of the trailer during a coupling operation, and lubricating means for lubricating sliding surfaces in said coupler, said lubricating means including a main groove formed in a central portion of the sliding surface of said wheel plate so as to surround a recess means for accommodating a pivot shaft of said coupler, and a plurality of convolution grooves formed in said sliding surface of said wheel plate along convolution curves starting from and surrounding said main groove, each of said convolution grooves being communicated at both ends thereof with said main groove within said sliding surface of said wheel plate.

4,480,850

TOE HOLDER FOR SAFETY SKI BINDINGS

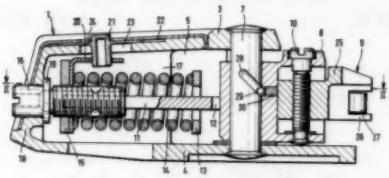
Klaus Schneider, 8104 Grainau, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,829

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1981, 3137485

Int. Cl.³ A63C 9/08

U.S. Cl. 280—630 6 Claims



1. A toe holder for safety ski bindings movable between a skiing and a releasing position for retaining the toe of a ski boot rigidly to a ski and releasing said ski boot from said ski on the application of forces dangerous to the skier, said toe holder comprising:

a housing fixedly mountable on a ski cylindrical axle means fixed in said housing and perpendicular to the top surface of a ski on which said toe holder is mounted;

sole holding means pivotally attached to said axle means for engaging the sole of a ski boot;

biasing means disposed within said housing and on one side of said axle for biasing said sole holding means towards a skiing position; and

guide means associated with said sole holding means and said axle for urging said sole holding means vertically along said axle means as said sole holding means pivots about said axle means, said guide means comprises:

a guide groove in said axle means, said guide groove sloping helically upward about the circumference of said axle means from a point on the axle means closest to the rear of said toe holder;

a bearing mounted in said sole holding means on the opposite side of said axle from said biasing means and vertically fixed with respect to such holding means; and

a retaining member mounted in said sole holding means, said retaining member urging said bearing into a position in which said bearing engages said guide groove; wherein

said bearing urges said sole holding means away from the ski along the axis of said axle means as said sole holding means pivots about said axle means, and moves said toe holder from said skiing position to said releasing position in response to the vertical movement of said sole holding means.

4,480,851

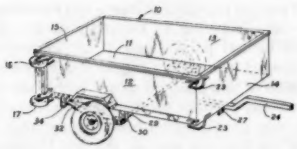
STOWABLE TRAILER

Luc St-Pierre, 1391 Langevin St., St. Hubert, Canada (J4T 1X5)

Filed Sep. 24, 1982, Ser. No. 422,888

Int. Cl.³ B62D 63/06

U.S. Cl. 280—656 2 Claims



1. A stowable trailer comprising, in combination, a frame defining a bottom and sides including a pair of opposite lateral sides, a pair of road wheel units connected to the frame and displaceable relative thereto between an operative position downwardly projecting from the bottom of the frame and a retracted stowage position laterally outward of the corresponding opposite lateral sides and upward relative to the bottom of the frame, each said road wheel unit including a suspension arm pivoted at one end to the frame, a road wheel rotatively carried by the suspension arm, and a spring releasably connecting the suspension arm to the frame and constructed and arranged for the displacement of the road wheel units between the downward operative position and the upward retracted position, each said road wheel unit being pivoted about a transverse axis relative to the frame, and stowage wheels operatively secured to said frame; wherein said trailer is tiltable from a road position, where said road wheel units are in said operative position with the ground, to a stowage position, where the trailer is upstanding edgewise on one of said sides and rollingly carried by side stowage wheel; wherein a common pivot axis extends transversely of the frame and defines opposite outer ends and the suspension arms of the road wheel units are pivoted at said outer ends respectively and arranged for pivotal displacement of the road wheel units relative to the frame between said downward operative position and upward retracted position; said spring including a leaf spring secured to the corresponding suspension arm at one end, aligned with the same suspension arm longitudinally of the frame, and having the other end releasably attachable to the frame and releasably pinned relative to the frame, so that said trailer one side constitutes the end of the frame forming a base and constructed and arranged to stow and stand the trailer thereon in upstanding edgewise stowage position; wherein the stowage wheels are secured against one lateral side of the frame and operatively project therefrom to rollingly support and move the frame for stowage and unstowage of the trailer, wherein the stowable wheels include a first stowage wheel secured to said one lateral side, a second stowage wheel, and a telescopic arm carries the second stowage wheel in axial position telescopically adjustable relative to the stowage wheels.

4,480,852

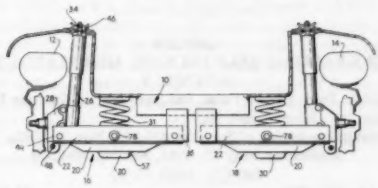
INDEPENDENT REAR WHEEL SUSPENSION HAVING A PIVOTABLE CONNECTION BETWEEN TWO TRANSVERSE CONTROL ARMS

Manfred Rumpel, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 334,334, Dec. 24, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,835

Int. Cl.³ B60G 3/00

U.S. Cl. 280—663 21 Claims



1. An independent rear wheel suspension for a vehicle comprising:

a chassis;

a wheel support member being adapted to rotatably mount a wheel;

an upwardly extending telescopic shock absorber having its lower end rigidly secured to said wheel support member;

means for pivotably connecting the upper end of said shock absorber to said chassis;

transversely extending front and rear control arms pivotably

connected at their inboard ends to said chassis and at their outboard ends to said wheel support member;

means integrally formed with one of said arms for seating a spring means interposed between said arm and said chassis; and

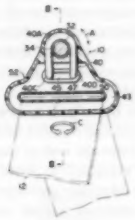
means for connecting said arms together at a point between their outboard and inboard ends so as to transfer spring loads exerted on said one arm to said other arm and to allow rotational movement of said arms in a horizontal plane.

4,480,853

WEBBING SUPPORTING DEVICE

Takayuki Ando, Okazaki, and Shinji Mori, Aichi, both of Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Sep. 30, 1982, Ser. No. 429,119
Claims priority, application Japan, Dec. 28, 1981, 56-198453
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—801 **10 Claims**



1. A webbing supporting device used in a seatbelt system to protect an occupant, for supporting an occupant restraining webbing on a vehicle body in an emergency situation of a vehicle, comprising:

a base portion mounted to the vehicle body and having a bobbin through which a bolt for mounting said base portion to the vehicle body extends;

a supporting portion for supporting said webbing; and

a bundle-shaped yarn member connecting said base portion to said supporting portion and holding said supporting portion in a manner to be movable relative to said base portion, said bundle-shaped yarn member being guided around and turned back at the outer periphery of said bobbin, whereby said webbing supported by said supporting portion is moved in accordance with a change in driving posture of said occupant or a change in physical build of an occupant entering the vehicle, so as to render a proper webbing fastened state to the occupant.

4,480,854

FREE-FALLING, SELF-LOCKING ADJUSTABLE TIP ASSEMBLY

Gerald A. Doty, Crown Point, Ind., assignor to Gateway Industries, Inc., Hazel Crest, Ill.

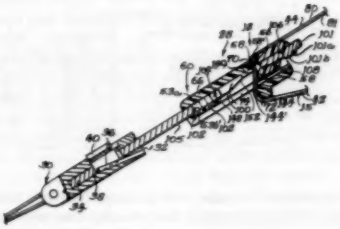
Continuation-in-part of Ser. No. 439,895, Nov. 8, 1982,. This application May 13, 1983, Ser. No. 494,569
Int. Cl.³ A62B *35/00*
U.S. Cl. 280—801 **14 Claims**

1. In a safety belt apparatus, the combination comprising: a safety belt having a shoulder portion and a lap portion, a seat belt retractor connected to one end of the safety belt and pullling on the belt for rewinding the belt and for pulling a portion of the belt into a generally vertical position when the belt is released for full retraction, a tip assembly slidably mounted on the belt and having a tongue plate for connection to a buckle, and snubber means on the tip assembly shiftable by the tongue plate hanging downwardly and with the belt in the vertical position to allow free sliding of the tip assembly downwardly along the belt, said snubber means including a slide being shifted to a belt gripping position by the belt under tension from the retractor when the tongue plate is connected to the buckle,

said slide having an opening through which the belt passes,

a slot in said tongue plate with the belt passing through the slot from the upper side of the tongue plate to a lower side of the tongue plate,

a stationary belt snubbing wall on the tongue plate at the



upper rear edge of the slot for snubbing engagement with the belt, a movable belt snubbing wall on said slide for shifting downwardly away from said stationary snubbing wall to allow free sliding of the web through said opening and said slot, and a

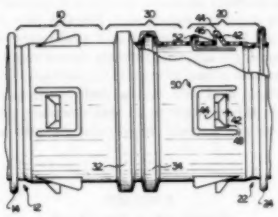
belt engaging means on said snubber means and on the lower side of the tongue plate which the belt and the pull of the belt on the same moves said slide upwardly to the belt gripping position.

4,480,855

COUPLING STRUCTURE FOR PLASTIC PIPE OR TUBING

Larry A. Rosenbaum, Findlay, Ohio, assignor to Hancor, Inc., Findlay, Ohio

Filed Mar. 11, 1982, Ser. No. 356,939
Int. Cl.³ F16L *47/00*
U.S. Cl. 285—3 **10 Claims**



1. A plastic internal coupler comprising:

generally opposed first and second end portions and a central portion disposed intermediate said first and second end portions;

said first end portion including at least a first extending cleat, said first cleat including an engaging surface disposed toward the central portion and a rear cammable wall disposed toward a first edge region, a first generally U-shaped region of thin plastic disposed within the first end portion and only partially surrounding the first cleat, the U-shaped, thin plastic region being thinner than the remainder of the first end portion, the first U-shaped, thin plastic region having a forward portion disposed between the engaging surface and the central portion, whereby the first cleat is resiliently movable between a first normal position extending from the first end portion and a second

position flexed arcuately at least partially below the first end portion.

4,480,856

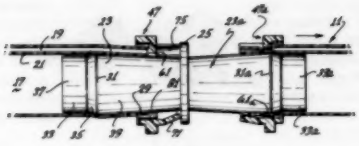
COUPLING

Robert B. Costa, Santee, Calif., assignor to RIS Irrigation Systems, El Cajon, Calif.

Filed Sep. 28, 1982, Ser. No. 425,421

Int. Cl.³ F16L *55/00, 33/00, 25/00*

U.S. Cl. 285—5 **10 Claims**



1. A coupling for flexible conduit which is noncircular in radial cross section and has a wall, said coupling comprising:

an inner member adapted to be at least partially received within the flexible conduit;

said inner member having an outer surface, said outer surface having a circumferentially extending region, a nose section extending in one direction from said region and adapted to facilitate insertion of the inner member into the flexible conduit, and a first conical surface extending in the other direction from said region and said first conical surface tapering radially inwardly as it extends away from said region;

a locking member adapted to receive the inner member and the flexible conduit;

said locking member including a sleeve with an inner surface defining a passage through the sleeve for receiving the inner member and the flexible conduit, said inner surface confronting said outer surface of said inner member when the sleeve receives the inner member in said passage;

said inner surface having a second conical surface which tapers radially inwardly and terminates in substantially a knife edge which is no more than 0.005 inch in axial dimension or has no more than a 0.003 inch radius;

said sleeve having an intersecting wall which intersects said second conical surface of the inner surface at an angle of no more than about sixty degrees to define said knife edge;

the angle of taper of the second conical surface being greater than the angle of taper of the first conical surface of the outer surface; and

whereby when the inner member receives the flexible conduit with the first and second conical surfaces confronting and tapering in the same direction, said first and second conical surfaces diverge at least 15 degrees as they extend toward said circumferentially extending region and the wall of the flexible conduit can be radially squeezed between the knife edge and the first conical surface of the outer surface to displace some material of the flexible conduit to tightly attach the flexible conduit to the coupling.

4,480,857

GIMBAL CONDUIT JOINT

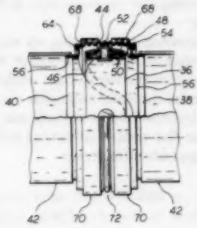
Robert W. Graves, Canoga Park, Calif., assignor to Aeroquip Corporation, Jackson, Mich.

Filed May 20, 1982, Ser. No. 380,225

Int. Cl.³ F16L *27/00*

U.S. Cl. 285—45 **10 Claims**

1. In a double gimbal ring conduit joint including a circular gimbal ring wherein first and second conduit receiving collars are pivotally connected to the gimbal ring by pivot pins, the pivot axes of the collars being perpendicularly related to each other, and the collars being interconnected by a flexible conduit, the improvement comprising a gimbal ring assembly defined by inner and outer radially spaced sheet metal rings, spacer means located between said inner and outer rings maintaining said inner and outer rings in radially spaced relationship, first and second pairs of pivot pins mounted on said gimbal ring assembly, each pivot pin radially extending through said inner and outer rings and the pins of each pair



being located upon diametrically opposite locations of said ring assembly and axially coincident to define a pivot axis, the pivot axes defined by each pivot pin pair being perpendicularly related, a conduit collar being pivotally connected to a pair of said pivot pins and connected to said pivot pins intermediate said inner and outer rings.

4,480,858

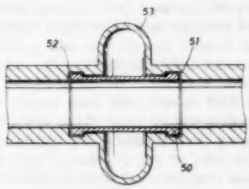
FLEXIBLE PIPELINE JOINTS

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 163,557, Jun. 27, 1980, Pat. No. 4,421,345. This application Apr. 21, 1983, Ser. No. 487,435

Int. Cl.³ F16L *27/00*

U.S. Cl. 285—114 **1 Claim**



1. A flexible length of pipe comprising at least two pipe ends flexibly joined with a flexible metallic element which is circumferentially outwardly extending and concave to the interior of the pipe and an interior retaining widering sleeve having ridges at its ends to fit into circumferential grooves on the interior surface of the pipe sections on both sides of the flexible element which separates the interior of the flexible element from the interior of the pipe, the inside surface of the retaining sleeve being essentially flush with the inside surfaces of the pipe sections.

4,480,859

FLEXIBLE CONNECTOR FOR FLAT WALL DUCTING

Todd J. Rueckl, Luxemburg, and Craig T. Pahnke, Denmark, both of Wis., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,555

Int. Cl.³ F16L *27/00*

U.S. Cl. 285—163 **3 Claims**

1. Flexible duct means for conducting gaseous medium between a pair of apparatus elements that are spaced apart in one direction and one of which is movable relative to the other in a pair of opposite directions that are substantially transverse

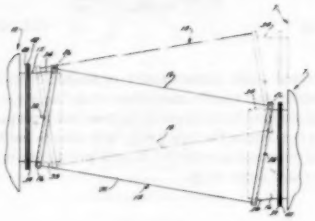
to said one direction, said flexible duct means being characterized by:

A. an elongated rigid sleeve duct extending between said elements with an end portion adjacent to each of them and having a rectangular cross-section at each said end portion defined by pairs of opposite walls;

B. a pair of rigid connector ducts, one for each of said apparatus elements, each said connector duct having an end portion of rectangular cross-section defined by pairs of opposite walls;

C. each said connected duct having its said end portion in telescoped relation to an end portion of the sleeve duct to define at each end of the sleeve duct a telescoped joint that comprises an inner duct and and outer duct surrounding it;

D. each of the telescoped ducts at each said joint having one pair of opposite flat walls that extend widthwise substantially in said opposite directions;



E. the inner duct at each said joint having on each of its other pair of opposite walls an external surface that is convexly curved lengthwise on a constant radius such that said external surface maintains a constant small distance from its adjacent interior surface of the outer duct as the telescoped ducts are swung in said opposite directions relative to one another;

F. a resiliently compressible gasket secured to the outer duct at each said joint, the inner duct being surrounded by said gasket and slidable therein and said gasket being compressed between the inner duct and the outer duct to seal the joint; and

G. the inner duct at each said joint having an outwardly projecting abutment on each of the walls of its said one pair, engaging the end edge of the flatwise adjacent wall of the outer duct in one position of said one apparatus element, said abutments substantially confining the sleeve duct against lengthwise displacement out of telescoped relation to the connector ducts.

4,480,860

TRANSITION COUPLING AND CLAMP ASSEMBLY CONTAINING SAME

Anthony J. Foresta, Andover, and James A. Tarara, Westford, both of Mass., assignors to Clamp-All Corp., Billerica, Mass.

Filed Aug. 29, 1983, Ser. No. 527,417
Int. Cl.³ F16L *21/00*
U.S. Cl. 285—177 **15 Claims**

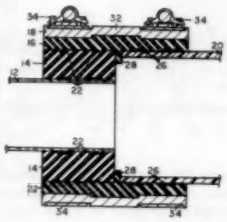
1. A clamp assembly for joining joint or pipe ends in a clamping relationship, which clamp assembly comprises:

(a) a clamping band to surround the ends of pipes or joints to be joined together;

(b) a polymeric, circumferential, thin sealing gasket having an interior surface and internal diameter and an exterior surface and exterior diameter, and disposed about the joint or pipe ends and beneath the clamping band to overlap the junctions between the joint or pipe ends, the internal surface of the gasket having circumferential raised sealing beads means thereon on the one side and on the other side of said junction, the sealing beads means to provide a sealing relationship against the exterior surface of the pipe or joint to be clamped together;

(c) means to tighten the clamping band and to compress the sealing gasket beneath the clamping band; and

(d) a first polymeric, circumferential transition coupling sealingly engaged within the sealing gasket on one side of said junction and having an external surface and external diameter and having an internal surface and a defined internal diameter, the external diameter substantially the same as the internal diameter of the sealing gasket, the transition coupling having circumferential raised sealing beads means on the internal surface thereof, to provide a sealing relationship with the exterior surface of the reduced diameter surface of a pipe or joint which is to be sealed by the transition coupling or with the external surface of another smaller size transition coupling, the transition coupling on the external surface characterized by circumferential inward groove means to engage in a removable sealing relationship with the raised sealing beads means of the gasket to provide for a clamp assembly whereby a pipe or joint of the same or different external diameter may be sealed together by the selection of the transition coupling or couplings within the clamp assembly.

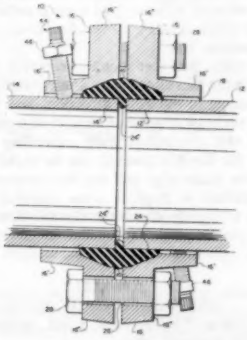


4,480,861

PIPE JOINT AND APPARATUS THEREFOR

Frank E. Cann, Jr., Mecklenburg County, N.C., assignor to Columbus Standard, Inc., Columbus, Ga.

Continuation-in-part of Ser. No. 235,554, Feb. 18, 1981, abandoned. This application Jan. 25, 1982, Ser. No. 341,916
Int. Cl.³ F16L *25/00*
U.S. Cl. 285—334.2 **16 Claims**



9. A pipe joint comprising an end of a first pipe, an end of a second pipe axially aligned in juxtaposed relation with said first pipe end, a pair of annular flange members slidably disposed in cooperative facing relation on said first and second pipe ends and having respective tapered annular interior surfaces cooperatively converging outwardly of said pipes forming an annular recess about said pipe ends, a resilient annular sealing gasket generally compatibly shaped with said recess and compressibly

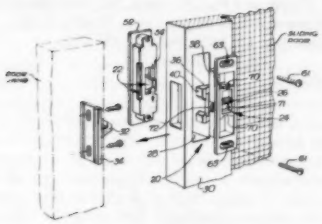
disposed surrounding and overlying said pipe ends within said recess, said gasket having a pair of tapered annular exterior surfaces converging outwardly in respective sealing engagement with said annular interior surfaces of said flange members, and means drawing said flange members axially together and compressing said gasket between said flange members by compressibly engaging said tapered annular exterior surfaces of said gasket with said tapered annular interior surfaces of said flange members, said tapered annular interior surfaces of said flange members being tapered at slightly smaller respective angles with respect to the axis of said pipes than said tapered annular exterior surfaces of said gasket when said gasket is uncompressed, whereby said drawing means causes said tapered annular interior surfaces of said flange members to engage and compressingly deform said tapered annular exterior surfaces of said gasket into full conforming engagement with said tapered annular interior surfaces of said flange members to compress said gasket against and between said pipe ends to seal said pipe ends.

4,480,862

LATCHING AND LOCKING MECHANISM FOR SLIDING DOOR

Paul D. Fleming, Glendale, Calif., assignor to W & F Manufacturing, Inc., Glendale, Calif. and Peachtree Doors, Inc., Norcross, Ga.

Filed Nov. 27, 1981, Ser. No. 325,238
Int. Cl.³ E05C *1/10*
U.S. Cl. 292—162 **18 Claims**



1. A latching and locking mechanism for use with a sliding door, the door being supported in a frame having a jamb, the jamb having a keeper mounted thereon, comprising:

latch means for releasable locking engagement with the keeper mounted in the door jamb of the sliding door, said latch means being mounted in the sliding door;

slide means operable from either side of the door for operating said mechanism to disengage said latch means from the keeper; and

locking means for disabling movement of said latch means to prevent disengagement of said latch means from the keeper, said locking means being operable from only one side of the door.

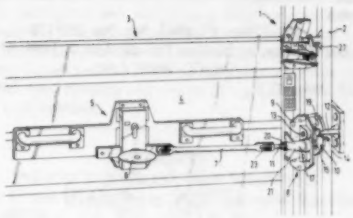
4,480,863

DOOR WITH LOCKING DEVICE

Michael Hormann, Steinhagen, Fed. Rep. of Germany, assignor to Hofmann KG Brockhagen, Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 414,839
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1981, 3135401
Int. Cl.³ E05C *3/16*
U.S. Cl. 292—216 **7 Claims**

1. In a door assembly of the type having a track which is connected to a building, and a door which is mounted on said track, a latch assembly for securing the door to the building, which comprises: a rotatable disk having an axis of rotation perpendicular to the track and parallel to the plane of the door, said disk having first and second openings about its periphery, said disk being connected to the door; a lock bolt connected to the building which is adapted to be received by said first opening when the door is closed; a latch bolt which is adapted to be received by said second opening when the door and disk are in



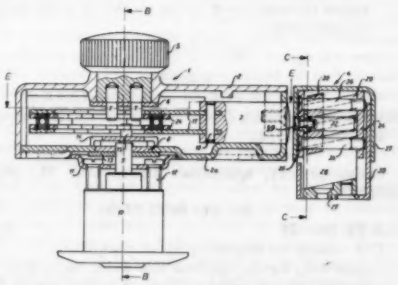
their closed position; whereby said disk is caused to rotate by said lock bolt when said latch bolt is withdrawn from said second opening; and wherein said latch bolt and said lock bolt are substantially parallel to the axis of rotation of said disk.

4,480,864

DOOR LOCK

Roger Parlier, Villa Prélac, 1166 Perroy, Switzerland

Filed May 11, 1982, Ser. No. 376,969
Claims priority, application Switzerland, May 15, 1981, 3192/81
Int. Cl.³ E05C *13/00*
U.S. Cl. 292—341.18 **10 Claims**



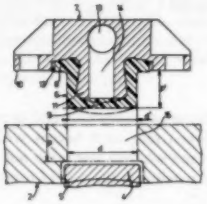
1. A keeper comprising a bolt receiving housing for said keeper, said housing being intended to be fixed to the frame of a door, characterized by the fact that said housing comprises on two internal sides facing each other parallel grooves forming an angle with the direction of movement of the bolt; said bolt having a supporting component and a runner presenting an opening allowing said bolt and said supporting component of the bolt to pass; members corresponding to the said grooves adapted to slide in said grooves; adjusting means being provided to allow the runner to move with respect to the housing and a blocking device for fixing the runner on the housing in the desired position.

4,480,865

DEVICE FOR GRASPING AND TRANSPORTING OBJECTS AND A METHOD FOR FINISHING SAID OBJECTS WITH THE AID OF SUCH A DEVICE

Jacques Chamdru, Le Mesnil Saint Denis, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 17, 1982, Ser. No. 359,170
Claims priority, application France, Apr. 7, 1981, 81 06983
Int. Cl.³ B66C *1/46*
U.S. Cl. 294—87 R **4 Claims**



1. A device for transporting and grasping objects, said device comprising:

a support movable relative to said object;

a pair of mountings oppositely mounted on said support for movement towards and away from one another and said object within said support, each of said mountings including an attachment face facing said support, a tip extending from said attachment face, a groove on said attachment face and surrounding said tip, and a pressurized fluid conduit opening on the distal end of said tip; and

a cup shaped supple element mounted on each said mounting, each said supple element being in the form of a body of revolution having a base adjacent said distal end of said tip, a cylindrical lateral surface, and interior surface conforming to said tip, and a rim in said groove, the height of said rim being greater than the depth of said groove,

whereby movement of said mountings of said pair of mountings towards one another clamps said rim between said attachment face and said support and whereby pressurized fluid from said conduit extends said bases of opposing supple elements towards one another to grasp said object therebetween.

4,480,866

VEHICLE FOR DISPLAYING GOODS

Shiro Komatsu, Osaka, Japan, assignor to Fujikin International, Inc., Osaka, Japan

Filed Dec. 15, 1982, Ser. No. 449,990
Claims priority, application Japan, Dec. 15, 1981, 56-187300[U]
Int. Cl.³ B60R *13/00*
U.S. Cl. 296—21 **4 Claims**

1. A vehicle for displaying goods comprising:

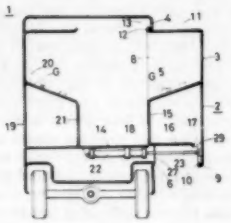
a main body having opposite side walls, and a floor and,

a display subbody provided toward at least one of the side walls, the subbody being open toward the interior of the main body and internally provided with a display rack,

the subbody being holdable in a position projected outward beyond the side wall of the main body when giving a display and adapted to be housed in the main body with its side wall substantially flush with the main body side wall during running, wherein

the display rack extends from the subbody side wall to the center of width of the main body as inclined downward, a vertical wall extends from the lower end of the inclined rack to a position a small distance above the floor of the main body, and a horizontal wall extends from the lower end of the vertical wall toward the subbody side wall to a position a small distance inward of the side wall,

the floor of the main body has a free edge to provide clearance between the floor and the subbody side wall, and an outer end of the horizontal wall is formed with a bent edge adapted to bear against the free edge of the floor from outside when the subbody is housed in the main body.

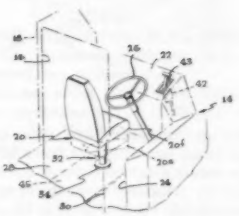


4,480,867

SWIVEL CHAIR SYSTEM

James J. Ezell, Clovis, and Paul V. Garin, III, San Mateo, both of Calif., assignors to A G Motor Corp., Fresno, Calif.

Filed Jan. 13, 1983, Ser. No. 457,726
Int. Cl.³ B60N *1/04*
U.S. Cl. 296—65 R **9 Claims**



1. In a vehicle cab having a seat area, a steering wheel lying closely in front and above the seat area, walls forming a rear doorway located behind the seat area for access and egress through the rear of the cab, walls forming a passageway at a first side of said seat area leading to said rear doorway, and a vehicle transmission moveable between neutral and drive settings, the improvement comprising:

a mount which supports said seat on said cab for rotation about a substantially vertical axis;

an actuator means for rotating said seat about said vertical axis between a forward orientation at which the front of the seat is positioned so the steering wheel lies immediately over the middle of the lap of a person seated in the seat and facing forward, and a sideward orientation which is angled from said forward orientation and at which the front of the seat faces largely toward said passageway; and

means responsive to the setting of said transmission for operating said actuator, to pivot said seat toward said forward orientation when the transmission is in a drive setting, and to at least release said seat so it can pivot toward said sideward orientation when the transmission is in a neutral setting.

4,480,868

MOTOR TRUCK BODY STRUCTURE

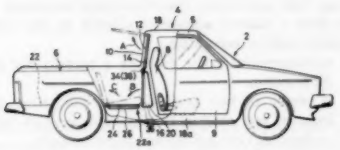
Masaaki Koto, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 12, 1982, Ser. No. 407,625

Claims priority, application Japan, Aug. 13, 1981, 56-127183

Int. Cl.³ B62D *33/06*

U.S. Cl. 296—190 **6 Claims**



1. A motor truck body structure comprising a cabin and a rear body, said cabin having a cabin body formed with a rear end opening provided with an upper rear panel and a lower rear panel, said upper rear panel being hinged at an upper edge portion with said cabin body so that it can be swung from an upright position upwardly and rearwardly to an open position, said lower rear panel being also hinged at a lower edge portion thereof so that it can be swung from an upright position downwardly and rearwardly to an open position, said upper and lower rear panels being able to cooperate with each other when they are in the upright positions to close the rear end opening of the cabin body, said lower panel being provided at the side facing the inside of the cabin body when in the upright position with seat cushion means so that an auxiliary seat is formed thereby when it is swung downwardly and rearwardly, said rear body including a load carrying floor structure having a movable floor panel segment provided at a front end portion thereof, said movable floor panel segment being hinged at a rear edge portion thereof to the floor structure so that it can be moved between a substantially horizontal retracted position and an erected position wherein it is erected from said floor structure, the movable floor panel segment being provided at a side facing downwardly when in the horizontal retracted position with seat back cushion means so that a seat back is provided when the floor panel segment is in the erected position for cooperation with the auxiliary seat provided by the lower rear panel.

4,480,869

ROOF WIND DEFLECTOR WITH MOUNTING SUPPORT

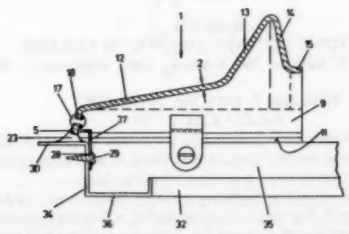
Theodor Splithoff, Hanau, Fed. Rep. of Germany, assignor to Ulrich Mobius, Hanau, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 347,039

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104309; Aug. 19, 1981, 3132713

Int. Cl.³ B60J *1/20*

U.S. Cl. 296—217 **32 Claims**



1. A detachable roof wind deflector for mounting on the sun roof of a motor vehicle, said wind deflector having a front wall and side walls, an air guide surface extending rearwardly from and at a selected angle to said front wall so as to rise gradually from the roof of the vehicle when situated on the roof, and said wind deflector having fastening means permitting adjustment of the wind deflector to accommodate various widths, said fastening means including an upper part attachable to the wind deflector, said upper part including a slide member arranged transversely to the longitudinal direction of the car roof, a slide element displaceable within said slide member, said slide element being connected to a lower part having a portion engaging the sun roof opening and means fixing said lower part to said sun roof opening.

4,480,870

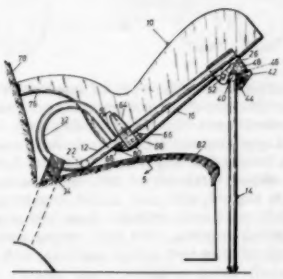
INFANT RESTRAINT FOR VEHICLES

Heinrich F. von Wimmersperg, 15721 Rosemont Rd., Detroit, Mich. 48223

Filed Oct. 13, 1981, Ser. No. 310,494

Int. Cl.³ B60R *21/10*

U.S. Cl. 297—216 **24 Claims**



1. An infant restraint for use in a vehicle comprising a frame, an infant support shell having a back and head support section and a seat and leg support section disposed generally perpendicular to each other, said shell having a fixed pivotal connection adjacent the upper end portion of said back and head support section with said frame for pivotal movement about a generally horizontal axis extending transversely of the shell, said shell having means for mounting it on a vehicle seat in a generally fixed position relative to the vehicle with the shell facing in a direction rearwardly of the vehicle, said mounting means including means adapted to rigidly engage the vehicle to prevent vertical downward displacement of said pivotal connection between said frame and shell, yieldable means interconnecting the shell and frame for retaining the shell on the frame in a normal riding position wherein the back and head support section of the rearwardly-facing shell is inclined substantially to the vertical such that an infant is comfortably supported in a somewhat reclined position by the shell, said yieldable means being responsive to deceleration of the vehicle resulting from a frontal impact to permit the lower portion of the shell to pivot about said fixed axis on the frame in a direction downwardly and forwardly relative to the frame so that the back and head support section of the shell assumes a more erect position and means for limiting pivotal movement of said shell in said direction to said more erect position.

4,480,871

DUMP BED STABILIZER

Eldred A. Fox, Box 654, Syracuse, Kans. 67878

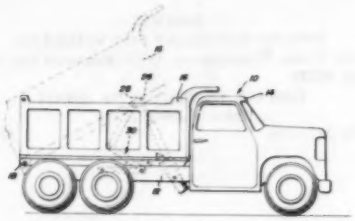
Filed Mar. 9, 1983, Ser. No. 473,557

Int. Cl.³ B60P *1/16*

U.S. Cl. 298—22 J **7 Claims**

1. In combination with a vehicle including laterally spaced longitudinal frame rails, a load bed pivotally supported from said frame rails and equipped with laterally spaced apart

stringer rails and lift means operatively connected to and between the frame and the load bed for raising the load bed to an inclined dumping position, a load bed stabilizer including a pair of elongated arm assemblies each having first and second ends, means pivotally joining said first ends for relative swinging of said arm assemblies in the same plane, first pivot means pivotally mounting the second end of one arm assembly to said frame rails and second pivot means pivotally mounting the second end of the other arm assembly to said stringer rails, said lift means being operatively connected between said frame and load bed independent of said stabilizer, at least one of said second ends including a transverse tubular member whose



opposite end portions define a pair of deep endwise outwardly opening sockets, a pair of socket members carried by and fixedly mouned upon the correpsonding rails and opening toward and opposing said sockets, said pivot means including pivot shafts having first and second ends, said first ends being adjustably slidingly telescoped into said sockets with said second ends aligned with said socket members, said shafts being partially outwardly shiftable from said sockets toward outward shifted positions with said second ends telescoped into and journalled in said socket members, said first ends of said pivot shafts being weldable in said outward shifted positions in said sockets.

4,480,872

MODIFIED STRIP MINING APPARATUS

Walter H. Hawkins, 3224 N. Bournewood Ave., Bowling Green, Ky. 42101

Filed Jan. 30, 1981, Ser. No. 230,011
Int. Cl.³ E21C *9/08*
U.S. Cl. 299—56 **5 Claims**

1. An apparatus for mining coal, comprising:
a. at least a cutter section having a substantially rectangular protective casing, said protective casing being reinforced and generally comprising four walls defining a space therethrough;
b. a cutter blade assembly rotatably mounted on the first end of said section for cutting into the coal to be mined, said cutter blade assembly generally comprising a first annular blade of substantially circumferential shape as said protective casings and having a second blade defining a single plane for cutting into the coal face;
c. a hydraulic motor for rotating said cutter blade assembly;
d. a shaft inter-connecting said hydraulic motor into said cutter blade assembly for rotating said cutter blade assembly when said hydraulic motor is operating;
e. connical flighting connected to said shaft for conveying coal from said cutter blade assembly rearward;
f. at least a second section attachable to the rear of said cutter section, comprising:
i. reinforcement walls defining a rectangular open area therewithin;
ii. a conveyor belt assembly extending from the lower front of said section to the upper rear of said second section for conveying coal therethrough;
iii. a means for attaching said second section to said first section, said means comprising rotatable arms for locking into a substantially u-shaped channel of said first section;
g. air pressurized means for reducing the friction between the outer surface of said upper and lower walls of said section, said pressurized air exiting said section through a plurality of ports and forming a frictionless layer between said earth and said upper and said lower walls of said section;
h. a conveyor belt assembly, said assembly generally comprising an endless conveyor belt extending from the rear of said conical flighting upper to the rear of said protective casing, and being mounted on a series of rollers powered by a hydraulic motor;
i. means for attaching said first section to a subsequent second second, said means comprising:
i. a plurality of connector arms moveable from a first unlocked position to a second locked position;
ii. a generally u-shaped channel, located on said subsequent section for receiving said connector arms in the locked position;
iii. a handle-like insertable into said connector arm assembly for rotating said arms into said locked position;
iv. cotter pins or the like for manually locking said arms into said locked position;
j. a pressurized fluid means for reducing the friction between the outer surface of said upper and lower walls of said section and the adjacent earth, comprising:
i. a source of compressurized air, said source being located outside of said section;
ii. a means for transporting said pressurized air from said source to the protective casing of said section;
iii. a plurality of ports located on the top and bottom of the protective casing of said section, said ports serving as an exit point for said pressurized air;
iv. a means for maintaining said pressurized air within the area between said upper and lower ports of said protective casing and the adjacent earth.

4,480,873

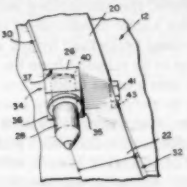
FLIGHTING SECTION AND TOOTH HOLDER

Winchester E. Latham, 701 Kentucky Ave., Indianapolis, Ind. 46225

Filed Jan. 7, 1983, Ser. No. 456,540
Int. Cl.³ E21C *35/18*
U.S. Cl. 299—87 **4 Claims**

1. Apparatus secured to a cutting drum of a scarifying milling machine for holding a cutting bit comprising:
a plurality of helical flighting sections fixed to the cutting drum, each flighting section including a first wall containing a plurality of recesses for receiving tool holders and a second generally continuous opposing wall, both walls being generally perpendicular to the cutting drum, and
a plurality of tool holders removably mounted within the

flighting section recesses of the first wall, each tool holder including a bore for receiving a cutting bit, each tool holder being received within each recess such that an edge



of the tool holder projects outwardly beyond the surface of the first wall a distance sufficient to protect the flighting section from abrasion so as to extend the life thereof.

4,480,874

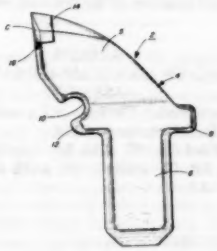
RETAINER DEVICE FOR AUGER, ROOF AND THE LIKE TYPE BITS

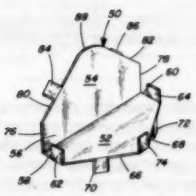
Ray H. Shaw, 557 E. 305th St., Willowick, Ohio 44094

Filed Sep. 16, 1981, Ser. No. 302,800

Int. Cl.³ E21B *10/46*

U.S. Cl. 299—91 **12 Claims**





1. A retainer device of the type to be mounted within a recess portion provided in the head of a tool bit, said retainer device comprising a body made from a consumable, non-ferrous metallic brazing alloy adapted, upon heating, to attach the cutting element to the head of the tool bit without the addition of brazing material, said body including a base portion and an integral upstanding wing portion, and said base and wing portion defining a seat to receive a carbide cutter element disposed therein.

4,480,875

ACCELERATOR FOR CONTROL VALVES, ESPECIALLY FOR TRIPLE PRESSURE CONTROL VALVES IN PNEUMATIC BRAKE SYSTEMS OR RAIL VEHICLES

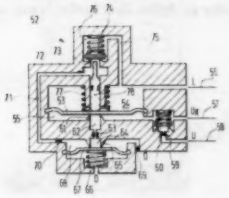
Johann Huber, Munich, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,505

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127774

Int. Cl.³ B60T *17/04*

U.S. Cl. 303—38 **8 Claims**



1. Accelerator for control valves, particularly triple pressure control valves (3) in pneumatic brake systems of rail vehicles, having a pick-up accelerator (30) reducing the air main pressure at the start of a braking operation, with a transfer chamber (40); an intake valve (10, 43) arranged between the air main (1) and said transfer chamber (40), said intake valve opening at the start of the braking operation; a discharge valve (48, 49) open only in the release position of said control valve (3), said discharge valve leading from said transfer chamber (40) to atmosphere; the accelerator also having a shut-off valve (34, 35 36) between said transfer chamber (40) and said intake valve (10, 43), said shut-off valve closing subsequent to the response of said control valve (3) and the filling of said transfer chamber (40); a piston element (53, 53') acted upon by the pressure in a line chamber (54) connected with said air main (1) against the pressure in a reference pressure chamber (55); service brake accelerator coupled with said piston element (53, 53') which is directly or indirectly open to the atmosphere while being preponderantly acted upon by the reference pressure; said reference pressure chamber (55) being connected to said transfer chamber (40), said transfer chamber (40) having a bleeder nozzle which is not open at all times.

4,480,876

ANTILOCK BRAKING SYSTEM

Makoto Sato, Kamifukuoka; Yoshitaka Miyakawa, Kawagoe; Etsuo Fujii, Wako, and Shohei Matsuda, Ooi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,549

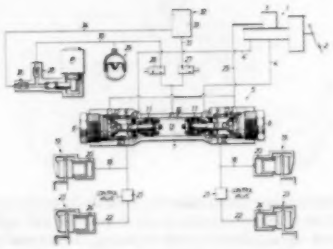
Claims priority, application Japan, Jun. 27, 1981, 56-100197

Int. Cl.³ B60T *8/10*

U.S. Cl. 303—103 **9 Claims**

1. A back-pressure type antilock braking system for a four wheeled automotive vehicle having front left and right wheels and rear left and right wheels and a determined load distribution of the vehicle on the front and rear wheels, each wheel having a respective brake cylinder for applying braking pressure to the wheel in response to pressure fluid supplied from a master cylinder, said antilock braking system comprising: a hydraulic circuit arrangement for supplying pressure fluid from said master cylinder to said front and rear wheels; fluid pressure control valve means disposed in said hydraulic circuit arrangement at a portion thereof leading to the brake cylinders of said rear left and right wheels and receiving pressure fluid from the master cylinder for controlling the supply of pressure fluid to the brake cylinders of the rear left and right wheels in accordance with the load distribution of the vehicle on the

wheels whereby all the front and rear wheels normally undergo incipient wheel slip at substantially the same time; and fluid pressure regulating means interposed in said hydraulic circuit arrangement upstream of said fluid pressure control valve means for relieving the fluid pressures transmitted to the respective brake cylinders associated with the four wheels of the vehicle when one of the two front wheels rotates at a higher circumferential speed than the other front wheel and indicates incipient wheel slip, said fluid pressure regulating means comprising a second source of fluid pressure and a single regulating unit for receiving pressure fluid from the master cylinder, said regulating unit including a cylinder having opposite closed ends, and a pair of pistons slidably mounted in said cylinder to define first and second, secondary hydraulic



fluid chambers in said cylinder at respective sides of said pistons remote from the opposite piston, said first, secondary hydraulic fluid chamber being connected to supply fluid pressure to one of said front wheels and one of said rear wheels while said second, secondary hydraulic fluid chamber is connected to supply fluid pressure to the other of said front wheels and the other of said rear wheels, and an antilock control fluid pressure chamber defined in said cylinder between said pair of pistons and connected to said second source of fluid pressure, said antilock control fluid pressure chamber receiving fluid pressure from said second source of pressure to apply the same as a back pressure against said pair of pistons thereby to relieve the fluid pressures transmitted from the secondary hydraulic fluid chambers to the front and rear wheels all at the same time.

4,480,877

RECIRCULATING PUMP FOR MOTOR VEHICLE BRAKE SYSTEM

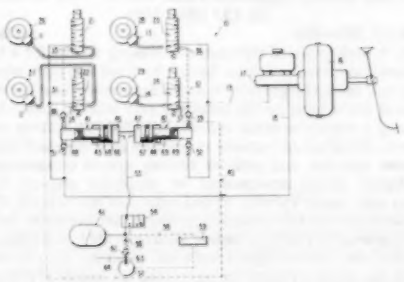
Reinhard Resch, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,407

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3119982

Int. Cl.[3] **B60T** *8/02*

U.S. Cl. 303—116 **12 Claims**



1. A recirculating pump device for a motor vehicle brake system having a master cylinder having respective pressure chambers connected to brake circuits with wheel brake cylinders and being equipped with anti-locking means operable on a recirculating principle, the anti-locking means being adapted to cyclically monitor a state of movement of braked wheels of the vehicle and to cause brake fluid from a wheel developing a tendency to lock up to be released from the brake cylinders of the affected wheel into a brake fluid return line leading to the master cylinder to be recycled thereby lowering a pressure in the brake cylinder, characterized in that the recirculating pump device includes at least one piston pump associated with each brake circuit of the brake system, each piston pump including a feed pressure chamber and a working pressure chamber, means for connecting the feed pressure chamber with recirculating line means communicating with the wheel brake cylinders of the respective brake circuits and to a brake line of the corresponding brake circuit leading to the respective pressure chamber of the master cylinder, pressure source means of the motor vehicle for forming a drive for the piston pumps, means for controlling the drive of the respective piston pumps such that the working pressure chambers are adapted to be connected at a predetermined frequency, being higher than a maximum frequency of a regulating cycle of the anti-locking means, to at least one of the pressure source means of the motor vehicle and a vent of a tank associated with the pressure source means, the piston pumps being constructed as free piston pumps each having a piston of a stepped configuration, a larger of the steps of each piston delimits the working pressure chamber, a smaller of the steps of each piston delimits the feed pressure chamber, and in that a ratio of effective piston surface area of the larger piston steps to the effective piston surface area of the smaller piston steps is at least equal to a ratio of a maximum braking pressure achievable in the brake system to a minimum initial pressure of the pressure source means.

4,480,878

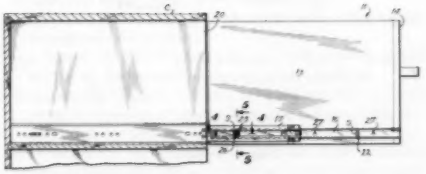
CLEARANCE ADJUSTABLE DRAWER SLIDE ASSEMBLY

Fred B. Leiper, Valley Cottage, N.Y., assignor to Hardware Designers, Inc., Waterbury, Conn.

Filed Jan. 14, 1983, Ser. No. 457,964

Int. Cl.[3] **F16C** *21/00*; **A47B** *88/00*

U.S. Cl. 308—3.8 **3 Claims**



1. A drawer slide assembly comprising a first channel adapted to be mounted to a cabinet, a second channel adapted to be mounted to a drawer, and an intermediate channel nested with and slidably connected to said first and second channels for axial translatory relative movement with respect to each of said first and second channels, said channels including parallel web portions, said channels being shiftable between a closed position whereat said channels are in registered overlapping position to an extended position whereat said intermediate channel projects from said first channel and said second channel projects from said intermediate channel, stop means interposed between said intermediate channel and said first and second channels, respectively, for blocking axial movement of said channels beyond a predetermined fully extended position, a first series of mounting apertures through the web portion of said second channel, the apertures of said first series being mutually offset lengthwisely along said channel, at least two

vertically elongate adjustment apertures formed in said web of said second channel in mutually spaced relation, at least one of said adjustment apertures being located adjacent an inner end portion of said channel, and an access aperture formed in said web of said intermediate channel, said access aperture being positioned to register with said one of said adjustment apertures only in said fully extended position of said channels.

4,480,879

ROLLING BEARING ARRANGEMENT FOR LENGTHWISE MOVEMENT OF A HOUSING ON ONE OR TWO MUTUALLY PARALLEL RAILS

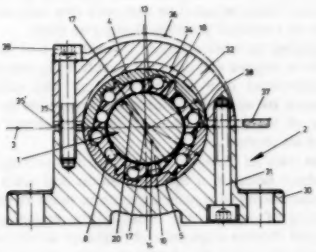
Walter Reith, Bad Bocklet, and Lothar Walter, Schweinfurt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfavriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,436

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131321

Int. Cl.³ F16C *29/06, 29/00*

U.S. Cl. 308—6 C **3 Claims**



1. In a rolling bearing arrangement for lengthwise movement of a housing on a pair of rails, wherein torque is transmittable between said housing and rail, the improvement wherein a pair of sleeve sections is arranged in said housing, each of said sleeve sections having a cylindrical concave surface, said concave sections being directed away from one another, each sleeve having at least one continuous row of rolling bodies and having a longitudinally extending race for loaded rolling bodies and a return race for unloaded rolling bodies in each continuous row, said loaded rolling bodies of each of said sleeve sections engaging a separate one of said rails, the centers of curvature of said sleeve sections being displaced from one another on opposite sides of a longitudinal central plane extending transverse of the plane joining the centers of the two rails and substantially parallel to the longitudinal axes of said rails, the inner race for the loaded rolling bodies of each sleeve section comprising a longitudinally extending cylindrical section of the rail corresponding to and concentric with the respective sleeve section.

4,480,880

SLIDE AND SWING CHASSIS ASSEMBLY FOR ELECTRONIC EQUIPMENT

Robert L. Cather, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 11, 1983, Ser. No. 522,283

Int. Cl.³ F16C *29/04*

U.S. Cl. 308—6 R **14 Claims**

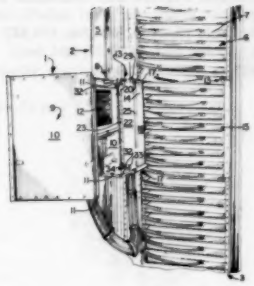
1. A movable chassis system for use in an enclosure having a front opening, sides, and a rear portion to which access is desired, comprising:

slide members along the sides of the enclosure;

a chassis supported by said slide members and slidable therealong;

a slide plate pivotally attached at one side of the rear of the chassis, movable from a closed position along the rear of the chassis to an extended position parallel with said one side, slidable along the slide member when in extended position, and adapted to support the chassis; and

stop means adapted to move said slide plate to extended position when the chassis is moved towards the opening of



the enclosure, such that the chassis is slidable from the rear of the enclosure to the opening and pivotal to one side, while supported by the slide plate, to freely expose the rear portion of the enclosure.

4,480,881

BEARING DEVICE

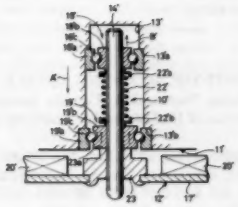
Tohru Fujimori, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,996

Claims priority, application Japan, Jun. 10, 1981, 56-85436[U]

Int. Cl.³ F16C *35/06;* **H02K** *5/173*

U.S. Cl. 308—189 A **8 Claims**



1. A bearing device for relatively rotatably supporting rotary and stationary members and transmitting a thrust load therebetween, comprising

first and second ball bearings each including inner and outer ring races having radially confronting annular grooved surfaces, and balls between said ring races in rolling contact with said grooved surfaces;

said rotary member having an axially opening recess and having axially spaced first and second annular shoulders formed in a wall surface of said recess and facing axially in the direction in which said recess opens, with said outer ring races of said first and second ball bearings, respectively, received in said recess and seated against said first and second shoulders, respectively;

said stationary member having an additional annular shoulder facing axially in opposition to said direction in which said recess opens and having said inner ring race of said first ball bearing seated thereagainst; and

yieldable means interposed between said inner ring race of the first ball bearing and the inner ring race of the second ball bearing for urging said inner ring races of said first and second ball bearings axially apart and thereby pre-

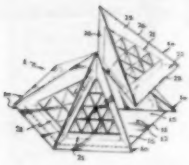
loading said ball bearings for distributing said thrust load therebetween.

4,480,882

DISPLAY CASE FOR JEWELRY AND THE LIKE

Lawrence M. Poltash, 517 3rd St., Manhattan Beach, Calif. 90266

Filed Feb. 15, 1983, Ser. No. 466,632
Int. Cl.³ A47B *81/00*
U.S. Cl. 312—107 **11 Claims**



1. A display case comprising:

(a) a plurality of interchangeable modules;

(b) a support stand including a planar receiving surface for supporting said modules thereon;

(c) means for temporarily fastening said modules to said stand;

(d) each of said modules including a planar support surface, a display device affixed to said planar support surface, a window unit including a transparent front window and means for temporarily fastening said window unit to said planar support surface, said planar support surface being disposed essentially parallel to and adjacent said planar receiving surface when said modules are supported by said support stand.

4,480,883

ANTI-TIP BLOCKING DEVICE

William W. Young, Newmarket, Canada, assignor to Office Specialty Division of Hollanding Inc., Holland Landing, Canada

Filed Jun. 20, 1983, Ser. No. 506,006
Claims priority, application Canada, Feb. 25, 1983, 422380
Int. Cl.³ E65B *65/46*
U.S. Cl. 312—220 **23 Claims**

1. A safety lock system for use in vertically stacked slidably retained storage elements for preventing the opening of more than one element at a time, said system comprising:

a plurality of locking bars and a plurality of cam elements being vertically slidable in a vertical support guide means alternately stacked in vertical alignment one upon the other for limited vertical displacement therein defined by said vertical support guide means;

each cam element having a cylindrical bearing surface to contact said vertical support guide means so that the cam element is vertically slidably retained by the guide means while rotatable about the axis of said cylindrical bearing surface between:

(i) a first neutral position in which first cam portions of the cam element space opposed ends of adjacent locking bars alternating therewith by a first displacement distance, and

(ii) a second extended position in which second cam portions of the cam element space opposed ends of said adjacent locking bars by a second displacement distance a predetermined distance greater than said first displacement distance;

said limited vertical displacement and said predetermined distance being selected so that only one cam element can be in an extended position at any one time;

an engaging member coupled to each of said storage elements to engage and displace an activating arm portion of an associated cam element rotating said cam element between its neutral and extended positions by displacement of the storage element between closed and open positions thereof,

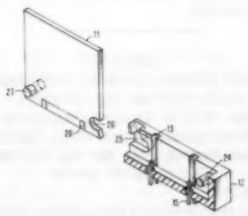
wherein with all of said storage elements carrying engaging members being in a closed position and with said cam elements being in a neutral position, upon at least partial opening of one storage element, the engaging member coupled thereto engages and displaces an activating arm portion of an associated cam element rotating the associated cam element to its extended position preventing the remaining cam elements from rotation to extended positions whereby respective actuating arm portions of the remaining cam elements upon engagement by engaging elements block opening of remaining storage elements carrying engaging elements.

4,480,884

ZERO INSERTION FORCE CONNECTOR AND CIRCUIT CARD ASSEMBLY

Robert Babuka, Vestal; Andrea Burke, Endicott, both of N.Y., and Paul E. Haiges, Jr., Brackney, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,041
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—17 L **4 Claims**



1. A connector-card retention and polarization device comprising:

a printed circuit card having a row of circuit tabs along one edge;

a zero insertion force connector having opposing rows of flexible spring contacts;

means for opening and closing said contacts to allow for

zero insertion force positioning of said card in between said contacts when they are open and to cause said contacts to engage the circuit tabs on the card with a wiping action when they are closed;

a pin at one end of said connector and a pin slot at the opposite end; and

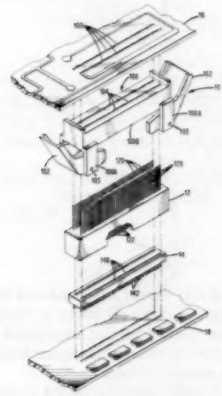
a pin slot at one end of said card and a card pin at the opposite end, the pin and pin slot in said connector and pin slot and pin in said card being arranged to respectively come into engagement when said card is inserted into the connector to prevent movement of the card when the connector spring contacts are closed.

4,480,885

PRINTED CIRCUIT BOARD INTERCONNECTION SYSTEM

Maurice A. Coppelman, Framingham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 16, 1983, Ser. No. 467,002
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—45 M **22 Claims**



1. An assembly for interconnecting a pair of printed circuit boards for easy disconnection, each of said printed circuit boards having component and solder sides wherein the pins of a double pin connector pass through said assembly, portions of said pins on one side of said double pin connector are solderable to the solder side of one of said printed circuit boards and the pin portions on the other side of said connector are insertable into a mating connector which is solderable to the solder side of the other printed circuit board so that the component side of both boards face each other, said assembly comprising:

a spacer member being shaped for housing said double pin connector, said spacer member having top, end and side walls, said top wall having a plurality of holes through which said pins of said double pin connector pass through, each side wall having a support leg at each end extending outward from said side wall by a predetermined amount; and

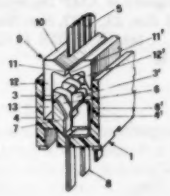
a pair of identically constructed ejector members, each ejector member having side and back walls molded in a predetermined shape, each of said ejector member side walls being elbow like in shape having vertical and horizontal arm portions, and said ejector members including means for attaching said ejector members to said end walls of said spacer member and said vertical portions of said ejector members when simultaneously moved in a vertical direction to a maximum vertical position producing downward forces at the ends of said horizontal arm portions of said ejector members onto said other printed circuit board causing damage free separation of said connectors.

4,480,886

QUICK CONNECTOR FOR A MULTI-CONDUCTOR CIRCUIT

Vito Bergamin, Padua, Italy, assignor to Zetronic S.p.A., Padua, Italy

Filed Jan. 31, 1983, Ser. No. 462,439
Claims priority, application Italy, Mar. 2, 1982, 84110 A/82
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—75 MP **16 Claims**



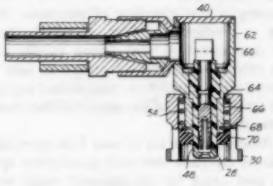
1. A quick connector for a multi-conductor circuit comprising a base member having a longitudinal cavity divided into a plurality of seats whose center distances equal the center distances of conductors in a multi-conductor circuit, a pair of opposing springs for each seat connected to a common terminal emerging from the base member, at least one spring of each pair being yieldingly displaceable toward the other spring, and a cover insertable into the longitudinal cavity of the base member and having opposing resilient ledges defining a longitudinal slot through which a multi-conductor circuit may be introduced into the connector without force, said resilient ledges approaching each other during insertion of the cover into the cavity of the base member and retaining the multi-conductor circuit by clamping action, and means on at least one of said ledges engaging one corresponding spring of each pair and causing it to yieldingly approach the other spring of each pair.

4,480,887

ANGLE PLUG CONNECTOR

John A. Morelli, Coram, N.Y., assignor to Automatic Connector, Inc., Commack, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,212
Int. Cl.³ H01R *13/625*
U.S. Cl. 339—94 C **8 Claims**



1. In a plug type bayonet connector, an assembly for the connector end of said plug connector, said assembly comprising a one-piece body comprising an outer cylindrical segment terminating in an inwardly tapered wall segment which terminates in a cylindrical front end of said body, a sleeve adapted to serve as the end covering of said plug connector, said sleeve being loaded onto said body, a spring having an inner diameter slightly greater than the outer diameter of said cylindrical front end and having a length which is less than the length of said cylindrical front end when said spring is compressed, said spring being loaded onto said cylindrical front end and having

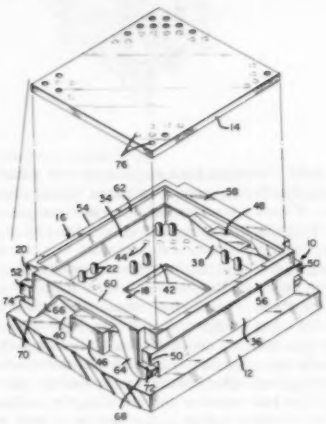
an outer diameter slightly less than that of the inner diameter of said sleeve, a washer loaded onto the spring compressing the spring such that the end of said cylindrical front end projects beyond said washer, said projecting front end projecting beyond said washer and being deformable, said projecting front end being deformed about said washer to capture said spring between said body and said sleeve.

4,480,888

MULTI TERMINAL LOW INSERTION FORCE CONNECTOR

John R. Hopkins, Cambridge, Md., and Leon T. Ritchie, Clearwater, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 23, 1982, Ser. No. 391,312
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—74 R **9 Claims**



1. A low insertion force connector for electrically interconnecting first and second members, said connector comprising:

a plurality of elongated first terminals each having a first mounting end adapted to electrically and mechanically fixedly engage said first member and second oppositely directed mating end formed by at least two normally diverging arms; a like plurality of second terminals fixed to said second member, said arms of said first terminals adapted to electrically and mechanically engage said second terminals; and

a frame having a like plurality of apertures therein each receiving a respective first terminal therethrough, whereby movement of said frame axially of said first terminals causes said arms to be driven into and out of contact with said second terminals of said second member,

said second terminals on said second member being conductive apertures, and

said frame driving said arms of said first terminals together for low force insertion into said conductive apertures and releasing said arms for engagement with walls of said conductive apertures.

4,480,889

ADAPTER AND METHOD FOR TAPPING OR SPLICING FLAT MULTICONDUCTOR CABLE

William S. Greenwood, Nutley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Jan. 7, 1982, Ser. No. 337,662
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—99 R **15 Claims**

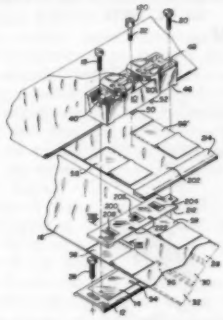
7. A tap or splice assembly comprising:

a first flat elongate multiconductor cable having a plurality of longitudinally extending laterally spaced conductors encased in insulation defining upper and lower major surfaces;

a metallic shield overlying said upper surface of said first cable and having a width of extent at least sufficient to span the lateral expanse of said conductors of said first cable;

a second flat elongate cable having a plurality of longitudinally extending laterally spaced conductors encased in insulation defining upper and lower major surfaces, said second cable lying over the metallic shield and in longitudinal alignment with the first cable such that conductors of said first cable are in longitudinal registry with conductors of said second cable;

an adapter having a substantially planar elongate insulative body and a plurality of conductive members spaced longitudinally therealong, said conductive member including contact means projecting from both major surfaces of said planar body, said adapter being interposed between the



lower surface of said second cable and said metallic shield with the conductive members being in registry with the respective cable conductors that are aligned in longitudinal registry, a first conductive member being adjacent a portion of said metallic shield;

a portion of said metallic shield adjacent a second conductive member being displaced, thereby exposing a portion of the upper surface of said first cable; and

means compressing said first and second cables, said metallic shield and said adapter together such that contact means on said first and second conductive members penetrate through the insulation on the lower surface of said second cable and engage respective conductors therein and contact means on said second conductive member penetrates through the exposed portion of said upper surface of said first cable and engages a conductor therein and contact means on said first conductive member electrically contacts a portion of said metallic shield.

4,480,890

CONNECTOR DEVICE

John J. McGlew, Box 823 (E. Lake Rd.), Tuxedo Park, N.Y. 10987

Filed Oct. 13, 1981, Ser. No. 311,034
Int. Cl.³ H01R *27/00*
U.S. Cl. 339—113 R **14 Claims**

1. An electrical connector, comprising a first member having

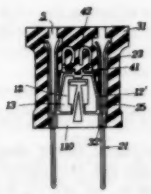
a plurality of engaging contacts, a second member having a plurality of receiving contacts including corresponding ones of which are associated with corresponding ones of said engaging contacts for selective electrical interengagement therewith to complete an electrical circuit, said first and second members being movable relative in respect to each other between an engaged position in which electrical engagement occurs with at least one contact and to a disengaged position in which none of the electrical contacts are interengaged, at least one of said first and second members having at least one set of respective associated engaging and receiving contacts positioned thereon so that the associated ones of said engaging and receiving contacts do not interengage in an engaged position of said first and second members, said first and second members are movable relatively and being juxtaposed when they are in an electrically interengaged position, said first and second members being movable relatively and being electrically interengaged when one of said members is spaced away from the other of said members, and measuring means associated with said first and second members for indicating at least one position of electrical interengagement.

4,480,891

ELECTRICAL PLUG AND SOCKET HAVING REPLACEABLE OVERCURRENT-PROTECTION DEVICE WITH SAFETY LATCH MEANS

Jeng-Shyong Wu, No. 133 Tungshing Rd., Toufun, Maulii, Taiwan

Filed Sep. 14, 1981, Ser. No. 302,062
Int. Cl.³ H01R *13/68*
U.S. Cl. 339—147 P **19 Claims**



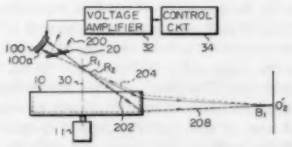
1. In an electrical connection device having an insulating body, a pair of electrical conductors entering said body and terminating in respective connection terminals, a pair of connection electrodes and apertures for connection thereof to a mating device at at least one end of said insulating body, said body further having an outwardly opening chamber between said conductors, overcurrent-protection device means receivable within said chamber and positioned for connecting each of said connection terminals to a corresponding one of said connection electrodes for circuit completion, fuse elements carried on said overcurrent-protection device means, and safety latch means comprising at least one latch member adapted to be removably inserted into said insulating body chamber to maintain said overcurrent-protection device in operative position, the direction of removal of said at least one latch member from said body being the same as the direction in which said connection device is connected to a mating device; the improvement comprising the at least one latch member being adapted to cause opposed portions of said overcurrent-protection device to be forcefully displaced outwardly in opposite directions lateral to the direction of insertion of the latch member into said insulating body chamber by wedging action of the latch member upon said opposed portions during said insertion for establishing circuit-making engagement between the associated fuse elements and the components in said electrical connection device in a positive, reliable manner.

4,480,892

LIGHT BEAM DEFLECTING APPARATUS

Hiromi Ishikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Apr. 15, 1983, Ser. No. 485,363
Claims priority, application Japan, Apr. 16, 1982, 57-63418
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—3.71 **10 Claims**



1. Light beam deflecting apparatus comprising:

sweeping means having a hologram for producing a diffracted light beam from an incident light thereto for changing the position of the hologram relative to the incident light to sweep the diffracted light beam;

wavefront control means placed in the path of either of the incident light and the diffracted light beam and responsive to electrical signals applied thereto for controlling the wavefront of said either of the incident light and the diffracted light beam; and

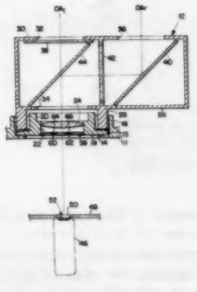
a control circuit responsive to the sweeping of the diffracted light beam by said sweeping means for applying the electrical signals to said wavefront control means, said control circuit being operative to adjust the electrical signals in association with the sweep movement of the diffracted light beam in such a manner that a converging point of the diffracted light beam delineates a substantially straight line on a scanning plane.

4,480,893

OPTICAL AND VIEWING SYSTEM FOR STEREOSCOPIC PHOTOGRAPHY

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 27, 1981, Ser. No. 257,734
Int. Cl.³ G02B *27/26*; G03B *21/00, 35/06*
U.S. Cl. 350—132 **20 Claims**



1. A stereoscopic optical system for use in photographing three-dimensional scenes with lenticular type film, said optical system comprising:

means for facilitating the positioning of the lenticular film in a plane for exposure;

means for defining two separated optical paths along which light from a scene to be photographed can travel to provide two different views of the scene, for polarizing the

scene light from each of said views in planes orthogonal to one another to encode the light from each of said views, and for combining the encoded scene light from each view and directing it to travel along a single optical path;

an objective taking lens positioned along said signal optical path for receiving the combined encoded scene light from both of said scene views and focusing said light on said film plane; and

means for defining at least one pair of laterally spaced apart apertures positioned ahead of the film in a plane located at or near the far conjugate of the film lenticules, along said single optical path, and proximate the stop of said objective lens to provide at least one pair of spatially separated light paths along which said objective taking lens focuses light onto said film plane and for transmitting without vignetting said encoded light from one view of the scene through one of said spatially separated apertures while transmitting without vignetting said encoded light from the other view of the scene through the other aperture of said spatially separated aperture pair so that the film lenticules can form microscopic images of the light passing through each of said spatially separated apertures, aside of one another on the photosensitive layers of the film located behind each lenticule, whereby said views of the scene are imaged in the film as a series of interlaced paired image strips one of which corresponds to a part of one of said views of the scene and the other of which corresponds to a part of the other of said views of the scene.

4,480,894

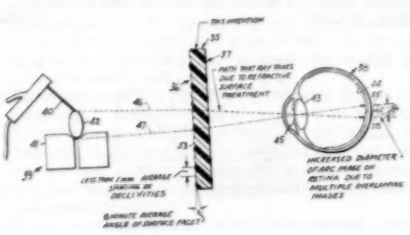
CURTAIN FOR SHROUDING WELDING OPERATIONS

Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif., assignors to Wilson Sales Co., Inc., South El Monte, Calif.

Division of Ser. No. 341,004, Jan. 20, 1982, Pat. No. 4,408,834, which is a division of Ser. No. 201,052, Oct. 27, 1980, Pat. No. 4,330,177, which is a continuation of Ser. No. 946,163, Sep. 27, 1978, abandoned. This application Jul. 22, 1983, Ser. No. 516,290

Int. Cl.³ G02B *27/02*

U.S. Cl. 350—167 **5 Claims**



1. In a welding curtain of substantial area forming at least a portion of the perimeter of an area in which an electrical arc welding or an electrical arc cutting operation is conducted for the purpose of protecting the eyes of an observer located outside of said perimeter from damage by light from said arcs, said curtain having a pair of surfaces spaced apart by a dimension of thickness, and being sufficiently clear for said observer to see through it can object of substantial size located inside said perimeter, the improvement comprising: one of said surface being covered with declivities having faces disposed at angles to the plane of the sheet, whereby some rays of light, which pass through said one surface are refracted and undergo a change in direction.

4,480,895

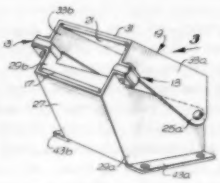
ADJUSTABLE REFLECTOR APPARATUS

William M. Carson, 4032 Coogan Cir., Culver City, Calif. 90230

Filed Nov. 24, 1981, Ser. No. 324,567

Int. Cl.³ G02B *5/08, 5/10*

U.S. Cl. 350—623 **9 Claims**



1. An adjustable reflector apparatus comprising:

first reflective means;

second reflective means;

means for securing together the first and second reflective means such that they successively reflect an incident beam of light and thereby redirect the beam in a direction substantially normal to its incident direction; and

adjustment means for adjusting the angle between the first and second reflective means and thereby correspondingly adjusting the direction of the redirected beam of light, the adjustment means including

a screw for coupling the first reflective means to the second reflective means, rotation of the screw adjusting the angle therebetween, and

a compressible, ring-shaped spacer disposed between the first reflective means and the second reflective means, surrounding the screw, for biasing the first and second reflective means apart from each other and thereby securing the screw in its adjusted position.

9. An adjustable reflector apparatus for redirecting an incident beam of light in a direction substantially normal to its incident direction, comprising:

a first U-shaped frame having a center segment and a pair of legs projecting in the same direction from opposite edges of the center segment;

a first flat, front-surface mirror secured to the center segment of the first U-shaped frame, on the same side as the pair of legs;

a second U-shaped frame having a center segment and a pair of legs projecting in the same direction from opposite edges of the center segment;

a second flat, front-surface mirror secured to the center segment of the second U-shaped frame, on the same side as the pair of legs;

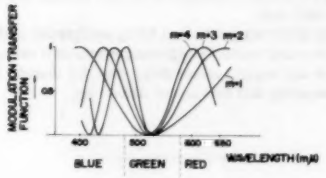
pivot means for pivotally securing together the remote ends of the pairs of legs of the respective first and second U-shaped frames, such that the angle between the first and second mirrors can be varied; and

adjustment means for controllably pivoting the first U-shaped frame relative to the second U-shaped frame and thereby adjusting the angle between the first and second mirrors such that they successively reflect an incident beam of light and redirect it in a direction substantially normal to its incident direction.

4,480,896
OPTICAL FILTER SUITABLE FOR PORTRAIT PHOTOGRAPHY

Souichi Kubo, Chiba, and Yukio Okano, Izumi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 18, 1982, Ser. No. 340,026
Claims priority, application Japan, Jan. 16, 1981, 56-5617
Int. Cl.³ G02B *5/20, 13/20*
U.S. Cl. 350—431 **5 Claims**



1. An optical filter for use with a sharp imaging lens, comprising a transparent substrate and a plurality of transparent minute spots disposed at random on said substrate for producing a phase difference between a wave front transmitted through said spots and that transmitted through the portion of the substrate other than said spots, said phase difference δ satisfying the following condition for producing a selective soft focus effect only for green light transmitted through said filter:

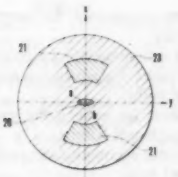
$$\delta = \frac{2m+1}{2}\lambda G$$

wherein m is an integer selected from 1, 2, 3 and 4, and λG is a design wavelength selected within the green wavelength range.

4,480,897
SINGLE-POLARIZATION SINGLE-MODE OPTICAL FIBER

Katsunari Okamoto; Toshihito Hosaka; Yutaka Sasaki; Juichi Noda, and Takao Edahiro, all of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jun. 15, 1982, Ser. No. 388,543
Claims priority, application Japan, Aug. 27, 1981, 56-133334
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.30 **2 Claims**

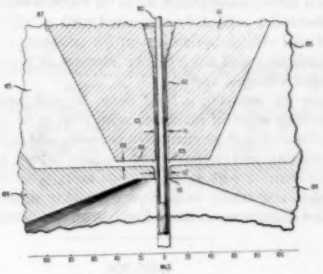


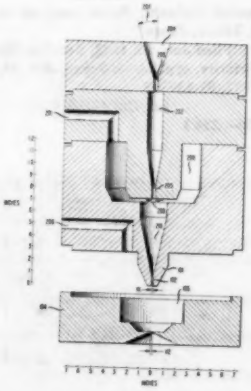
1. A single-polarization single-mode optical fiber of the type comprising an elliptical core, a pair of stress applying parts on both sides of minor radius of said elliptical core for applying asymmetrical stress thereto and a clad embedding therein said core and said stress applying parts, said stress applying parts being made of B_2O_3—SiO_2 characterized in that a relative refractive index difference Δ between the core and the clad satisfies a relation $0.004 \leqq \Delta \leqq 0.05$, an ellipticity ϵ defined by an equation $\epsilon = 1 - b/a$ satisfies a relation $0.01 \leqq \epsilon \leqq 0.9$ where a represents a major radius of the ellipse and b a minor radius thereof, said B_2O_3 constituting said stress applying parts has a molar concentration of 1 to 25 mole %, ratio of thicknesses of said stress applying parts and said core is 5 to 15, a modal birefringence B expressed by an equation $B = (\beta_x - \beta_y)/k$ satisfies a relation $B \geqq 1 \times 10^{31\,6}$ where $(\beta_x - \beta_y)$ represents a propagation constant difference between a HE_{11}^x mode and a HE_{11}^y mode, and k a wave number in vacuum, wherein a delay time difference between the HE_{11}^x mode and the HE_{11}^y mode which are orthogonal with each other is zero.

4,480,898
FIBERS WITH MULTIPLE COATINGS

Carl R. Taylor, Lawrenceville, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 454,159, Dec. 29, 1982,. This application Feb. 21, 1984, Ser. No. 581,787
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.30 **5 Claims**





1. A fiber coated by a process comprising passing the fiber through a first coating die that confines a first coating liquid around the fiber, the process further comprising thereafter passing the fiber through a second die, with a second coating liquid being applied onto the first coating liquid through a clearance between the first and second dies that is sufficiently small so that substantially no recirculation of the second coating liquid occurs in the immediate vicinity of the point of application to the first coating liquid, and wherein a gap forms between the second coating liquid and the aperture of the second die.

4,480,899

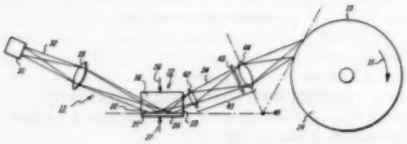
TWO DIMENSIONAL ELECTRO-OPTIC MODULATOR AND APPLICATIONS THEREFOR

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 8, 1981, Ser. No. 309,650

Int. Cl.³ G02F *1/01*

U.S. Cl. 350—356 **2 Claims**



1. An electro-optic modulator for spatially modulating a light beam essentially simultaneously in two dimensions in accordance with input voltages, said modulator comprising

an electro-optic element, and

a two dimensional planar array of individually addressable electrodes intimately associated with a reflective surface of said electro-optic element for coupling fringe electric fields into said electro-optic element in response to said input voltages, and

means for applying a light beam to said modulator at a grazing angle of incidence with respect to the reflective surface of said electro-optic element, said light beam illuminating said surface over an area which is essentially coextensive with said electrode array whereby said light beam is spatially modulated essentially simultaneously in two dimensions in accordance with said input voltages.

4,480,900

CAMERA SHUTTER WITH A PAIR OF SECTOR DRIVE RINGS

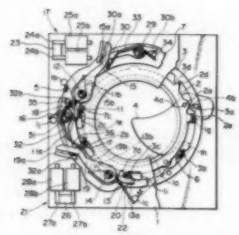
Tadao Hayami, Itabashi, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jun. 10, 1983, Ser. No. 503,003

Claims priority, application Japan, Jun. 25, 1982, 57-109621; Aug. 13, 1982, 57-139787

Int. Cl.³ G03B *9/22*

U.S. Cl. 354—234.1 **5 Claims**



1. A camera shutter comprising:

a pluarlity of sectors;

a first sector drive ring angularly movable under a spring force for opening said sectors;

a second sector drive ring angularly movable under a spring force in the same direction as that in which said first sector drive ring is angularly movable for closing said sectors;

first and second electromagnetic units for attracting said first and second sector drive rings, respectively, angularly to a set position against said spring force to hold said sectors in a closed position, said first and second electromagnetic units being energizable to release said first and second sector drive rings therefrom;

said sectors being openable when only said first sector drive ring is angularly moved under said spring force thereof, and closable when said second sector drive ring is anguarly moved under said spring force thereof;

a third electromagnetic unit disposed in confronting relation to said first sector drive ring and energizable for braking said first sector drive ring, said third electromagnetic unit being electrically connected to said second electromagnetic unit; and

said third electromagnetic unit being energizable at the same time that said second electromagnetic unit is energized to release said second sector drive ring, for thereby braking and stopping said first sector drive ring.

4,480,901

ARRANGEMENT FOR AND A METHOD OF PROCESSING PHOTOSENSITIVE ARTICLES

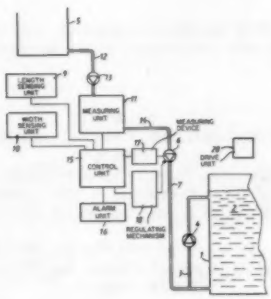
Viktor Osegowitsch, Taufkirchen, and Jürgen Leuchter, Tutzing, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,854

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147187

Int. Cl.³ G03B *3/06, 3/08*

U.S. Cl. 354—320 **52 Claims**



1. A processing arrangement for developing photosensitive articles, comprising:

(a) a container accommodating a processing bath;

(b) conveying means for advancing material to be processed through said bath;

(c) sensing means for sensing the amount of material advanced through said bath;

(d) a supply vessel accommodating a flowable regenerating agent for said bath;

(e) regulating means responsive to said sensing means and designed to deliver a predetermined quantity of said agent to said bath after a predetermined amount of material has been advanced through said bath, said regulating means including a flow regulating device for said agent;

(f) measuring means for measuring the actual quantity of said agent delivered to said bath; and

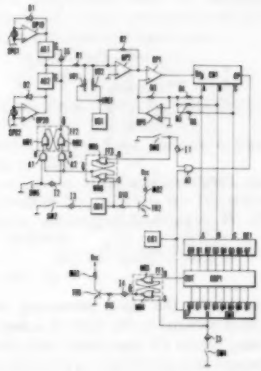
(g) control means connected with said sensing and measuring means, said control means being operative to determine deviation of said actual quantity from said predetermined quantity and to generate a control signal upon such deviation.

4,480,902

CAMERA HAVING LIGHT MEASURING MODE CHANGE-OVER DEVICE WITH SAFETY CIRCUIT

Masaharu Kawamura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1982, Ser. No. 441,091
Claims priority, application Japan, Nov. 13, 1981, 56-182642
Int. Cl.³ G03B 7/093
U.S. Cl. 354—434 8 Claims



1. A camera comprising:

a light measuring circuit having a plurality of light measuring modes, with different light measuring sensitivity distributions, wherein one of said plurality of modes is selectively used in accordance with the condition of an object to be photographed;

an exposure control circuit for controlling an exposure on the basis of an output of the light measuring circuit;

mode selecting means for selectively changing the light measuring mode; and

means for preventing the change-over of the light measuring mode by said mode selecting means in response to a shutter release operation in order to prevent an improper exposure.

4,480,903

CAMERA CAPABLE OF SWITCHING BETWEEN MANUAL EXPOSURE CONTROL AND SHUTTER PRIORITY AUTOMATIC EXPOSURE CONTROL

Masahisa Fujino; Akio Sunouchi, both of Tokyo; Tatsuo Konno, and Ryuji Suzuki, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,483
Claims priority, application Japan, Apr. 14, 1981, 56-55761
Int. Cl.³ G03B 7/08
U.S. Cl. 354—465 6 Claims

1. A camera capable of operation in open aperture as well as stopped down aperture manual exposure control modes and a shutter priority automatic exposure control mode, comprising:

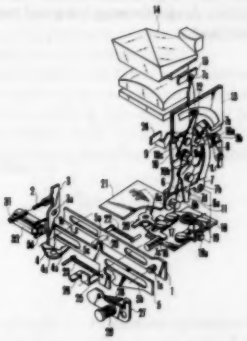
(a) a viewfinder with a view field;

(b) an aperture display scale plate in the view field;

(c) a diaphragm mechanism to control a diaphragm;

(d) a mechanical indicating member coupled with said diaphragm mechanism to indicate aperture information on said scale plate; and

(e) cut off means operatively coupled with the mechanical indicating member for cutting off the connection between said diaphragm mechanism and said mechanical indicating member in response to changing of said camera to either



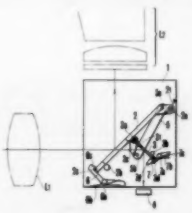
shutter priority automatic exposure control mode, or stop down manual exposure control mode.

4,480,904

ANTI-MIRROR-BOUNCE DEVICE FOR SINGLE-LENS REFLEX CAMERA

Akira Hiramatsu, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,960
Claims priority, application Japan, Nov. 12, 1981, 56-181550
Int. Cl.³ G03B 7/099, 19/12
U.S. Cl. 354—479 13 Claims



1. An anti-mirror-bounce device for a single-lens reflex camera, comprising:

a photo-taking lens forming a photo-taking optical path;

a first mirror disposed within said photo-taking optical path;

first locking means for locking said first mirror within said photo-taking optical path;

a second mirror disposed within said photo-taking optical path;

second locking means for locking said second mirror within said photo-taking optical path; and

driving means for driving said first and second mirrors to move them away from said photo-taking path.

4,480,905

CLEANING AND DEVELOPING UNIT

Masaki Yoshino, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

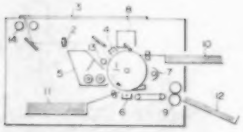
Filed Sep. 13, 1982, Ser. No. 417,290
Claims priority, application Japan, Sep. 16, 1981, 56-144784
Int. Cl.³ G03G 15/08
U.S. Cl. 355—3 DD 8 Claims

1. A cleaning and developing unit, comprising:

a plurality of developing rolls, comprising a first developing roll provided on an entrance side of said unit for cleaning

and developing an image on a sheet with a toner, and remaining developing rolls disposed on a second side for developing said image with said toner on said sheet;

a toner supplying device for supplying said toner to only said second side; and



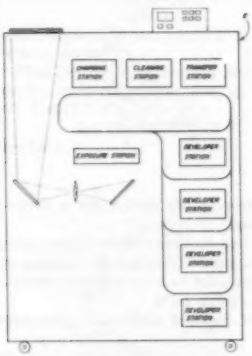
a barrier for adjusting amounts of developing agent allowed to migrate from said second side to said entrance side, said barrier being provided between said entrance side and said second side in such a manner as to at least partially separate said two sides from each other.

4,480,906

APPARATUS FOR MOUNTING DISCRETE IMAGE CARRIER SHEETS FOR MOVEMENT IN AN ELECTROGRAPHIC COPIER

Rex S. Titus; Robert J. Kindt, both of Rochester, and Robert M. Peffer, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,239
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **7 Claims**



1. For use in an electrographic copier having a track assembly with multiple tracks defining a path associated with copier process stations through which discrete image carriers are moved to form developed images on such carriers, apparatus for mounting such image carriers on selected tracks of such track assembly for movement along said path, said apparatus comprising:

means for supporting image carriers in a substantially planar condition; and

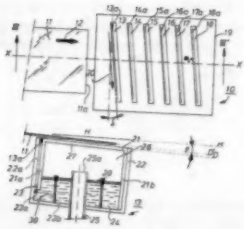
means, operatively associated with said supporting means, for engaging said selected tracks to mount such carriers on said tracks and to maintain such carriers, when moving along a portion of the path, in the same plane relative to that portion of the path regardless of the track engaged by said engaging means.

4,480,907

APPARATUS FOR THE LIQUID PROCESSING OF A SURFACE OF A MATERIAL IN THE FORM OF A SHEET, A WEB OR A PLATE

Leo N. Vackier, 's-Gravenwezel, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jan. 24, 1983, Ser. No. 460,612
Claims priority, application United Kingdom, Jan. 26, 1982, 8202099
Int. Cl.³ G03G *15/10*
U.S. Cl. 355—10 **12 Claims**



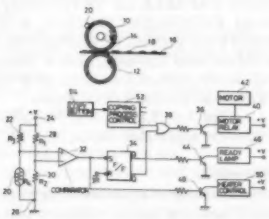
1. An apparatus for the liquid processing of the bottom surface of a plane material in the form of a sheet, a web or a plate, comprising means for supporting said material for advancement through said apparatus in a given direction along a predetermined generally straight path inclined to the horizontal, a plurality of supply chambers arranged in succession along the underside of said path for sequentially delivering processing liquid to said surface via discharge orifices in the upper ends of said chambers, said discharge orifices being disposed in a common plane which is parallel to the plane of said material traveling along said path, each of said discharge orifices being elongated with its lengthwise dimension intersecting said path of travel at an oblique angle.

4,480,908

THERMAL FIXING ROLLER SYSTEM IN A COPYING MACHINE

Shunju Anzai; Yoshiaki Ibuchi, both of Nara, and Akihiko Taniguchi, Kyoto, all of Japan, assignors to Sharp Kabushiki Kisha, Osaka, Japan

Filed Jun. 18, 1982, Ser. No. 389,917
Claims priority, application Japan, Jun. 30, 1981, 56-102686
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 FU **3 Claims**



1. A drive system for a thermal fixing roller system in a copying machine, which includes a heater roller having a heater disposed therein and a pressure roller, wherein a copy paper is driven to travel between said heater roller and said pressure roller in order to fix a toner image carried on the copy paper, said drive system comprising:

temperature detection means for detecting a surface temperature of said heater roller;

heater control means for energizing said heater disposed in said heater roller in accordance with a detection output derived from said temperature detection means so as to maintain the surface temperature of said heater roller around a preselected temperature;

drive means for rotating said heater roller and said pressure roller; and

control circuit means for activating said drive means immediately when a main power supply is initiated and before said surface temperature of said heater roller reaches said preselected temperature and for disabling said drive means when said surface temperature of said heater roller reaches said preselected temperature.

4,480,909

POTENTIAL CONTROL ON PHOTOSENSITIVE MEMBER

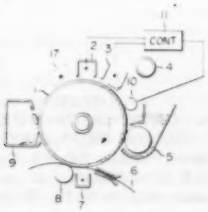
Hiroaki Tsuchiya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 241,420, Mar. 6, 1981, abandoned. This application Jan. 20, 1983, Ser. No. 459,690

Claims priority, application Japan, Mar. 13, 1980, 55-32260; Apr. 1, 1980, 55-43095

Int. Cl.³ G03G *13/02*

U.S. Cl. 355—14 CH **28 Claims**



1. An electrophotographic process for forming images on an electrophotographic photosensitive member which has been charged by a corona discharging means, wherein said process is selectively operable in a first mode in which an image of an original is formed with a first magnification, and in a second mode in which an image of an original is formed with a second magnification which is different from the first magnification, comprising:

moving the electrophotographic photosensitive member at different speeds corresponding to the magnifications selected;

forming, prior to an image formation at the selected magnification, a test latent image with the corona discharging means operated at an initial reference current which is different in dependence on the modes; and

detecting the potential of the test latent image and adjusting the current to the corona discharger in response to the detection of the potential.

4,480,910

PATTERN FORMING APPARATUS

Akihiro Takanashi, Kokubunji; Tatsuo Harada, Fuchu; Masamoto Akeyama, Kokubunji; Yataro Kondo, Koganei; Toshiei Kurosaki; Shinji Kuniyoshi, both of Tokyo; Sumio Hosaka, Hachioji, and Yoshio Kawamura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,436

Claims priority, application Japan, Mar. 18, 1981, 56-37977

Int. Cl.³ G03B *27/52, 27/68*

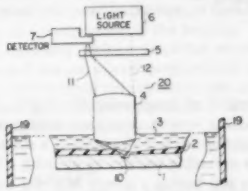
U.S. Cl. 355—30 **15 Claims**

1. A pattern forming apparatus for projecting a semiconductor device pattern, which is formed on a reticle, upon a photoresist layer on a substrate, comprising:

an illumination system for illuminating said pattern to project an optical pattern image;

a reduction lens system including at least one lens for projecting said optical pattern image at a certain reduction ratio upon the photoresist layer formed on the substrate for exposing the photoresist layer;

liquid sustaining means for filling a gap between said at least one lens of said reduction lens system and said photoresist layer with an optically transparent liquid having a refractive index of more than 1 (one), whereby the resolution of the pattern forming apparatus including the reduction lens



system is improved with respect to a pattern forming apparatus in which the gap is not filled with a liquid; and

pattern detector means for detecting the alignment of patterns between said reticle and said substrate by light reflected from said substrate and transmitted through said photoresist layer, said liquid and said reduction lens system to be incident on said pattern detector means, the refractive index of said liquid being substantially equal to the refractive index of a material of said photoresist layer so that the light incident on said pattern detector means is not influenced by unevenness of said photoresist layer.

4,480,911

DEVELOPING APPARATUS AND A DEVELOPING METHOD OF AN ELECTROSTATIC IMAGE

Masahiko Itaya; Satoshi Haneda, and Makoto Tomono, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,829

Claims priority, application Japan, Jun. 29, 1981, 56/104581

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD **11 Claims**

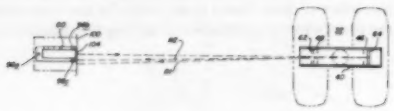
1. In an electrostatic copying apparatus of the type in which a magnetic developer is applied to a movable electrostatic image holder from a movable developing member, which in turn receives magnetic developer from a movable supply member, the improvement comprising a power source, and means alternately supplying said developing member from said power source with voltages of effectively opposite polarity, whereby said magnetic developer is attracted from said supply member to said developing member at one time, and from said developing member to said image holder at another time to produce a latent magnetic developer image upon the latter.

4,480,912

TRANSDUCER ALIGNMENT METHOD FOR WEIGHT AND BALANCE SYSTEM

John D. Snyder, Jr., Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 24, 1982, Ser. No. 351,960
Int. Cl.³ G01B *11/27*
U.S. Cl. 356—138 **10 Claims**



1. A method of determining the degree of parallelism of a first transducer mounting surface relative to a second transducer mounting surface disposed at a distance from the first transducer mounting surface by utilizing a laser developing a laser beam and having a screen disposed on the front thereof having an aperture through which the laser beam passes, and a first and second fixture each having a substantially flat mounting face, an aperture extending through the fixture from the flat mounting face and an optically flat mirror having a face and carried by the fixture and extending over the aperture, the mirror of the first fixture being partly light-transmissive to allow a portion of an incident laser beam to pass therethrough, the method comprising:

securing the first and second fixtures to the first and second transducer mounting surfaces, respectively, with the flat mounting faces contacting the mounting surfaces;

directing the incident laser beam toward the mirrors so that the incident laser beam is reflected by the mirrors of the first and second fixtures to form first and second reflected beams, respectively, which are projected upon a front face of the screen;

positioning the laser and screen so that one of the reflected beams is projected on a vertical line extending through the incident beam;

measuring a quantity b_H equal to the horizontal distance on the screen of the other reflected beam from the vertical line;

measuring a quantity B equal to the distance between the front face of the screen and the face of the closer of the two mirrors; and

determining the angular error between the first and second transducer mounting surfaces by solving the equation

$$\text{Angular error} = \tfrac{1}{4} \text{ Arc Tan } bH/B.$$

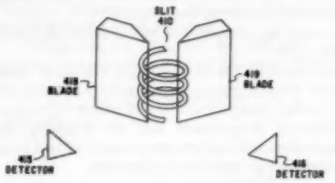
4,480,913

FINE POSITIONING BEAM DIRECTOR SYSTEM

John N. Dukes, Los Altos Hills; Charles E. Bryson, III, Palo Alto; Lynn Weber, Saratoga, and Mark Morganthaler, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 112,965, Jan. 17, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 340,158
Int. Cl.³ G01J *3/42*
U.S. Cl. 356—319 **6 Claims**

2. An improved optical section of the type wherein a source of light produces a light beam which is directed by a beam director to pass through a sample cell and impinge on an opaque barrier in which a detector slit has been produced to pass part of the beam to a detector, said beam director having a slit detector means responsive to any light incident on each side of the slit to produce signals representing the amount of light incident on each side of the slit, said beam director also having control means responsive to said signals to center the beam on the detector slit, said improvement comprising utilizing a slit having a width which is narrower than the width of the light beam by an amount which is minimally sufficient to



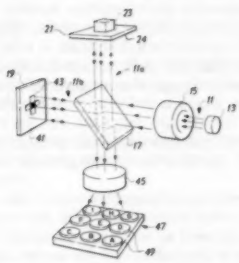
produce enough overlap of the beam onto each side of the slit that the beam can be centered on the detector slit.

4,480,914

VIBRATION COMPENSATING INTERFEROMETER MIRROR DRIVE SYSTEM

Duane T. Thompson, Franklin; Edwin L. Karas, Sharon, both of Mass.; Ernest F. Root, Nashua, N.H., and Fredrik Schlyter, Fairfield, Conn., assignors to The Foxboro Company, Foxboro, Mass.

Filed Sep. 13, 1982, Ser. No. 417,819
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—346 **19 Claims**



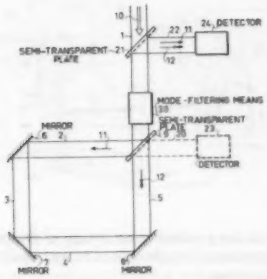
14. In an interferometer of the type in which a first light beam derived from a monochromatic source is incident on a fixed mirror and a second light beam derived from the same monochromatic source is incident on a moving mirror, wherein said moving mirror is to be moved both at a constant rate and at a constant angular tilt relative to the direction of incidence of said second beam on its reflective surface, and wherein said first and second light beams are recombined after reflection from their respective mirrors, the apparatus comprising:

means for deriving from the recombined light beams both a first set of error signals indicating deviations in the rate of movement of said moving mirror from said constant rate and a second set of error signals indicating deviations in the angular tilt of said moving mirror from said constant angular tilt.

4,480,915
RING INTERFEROMETER DEVICE AND ITS APPLICATION TO THE DETECTION OF NON-RECIPROCAL EFFECTS

Hervé Arditty; Michel Papuchon, and Claude Peuch, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 3, 1980, Ser. No. 212,435
Claims priority, application France, Dec. 14, 1979, 79 30722
Int. Cl.³ G01B 9/02; G01C 19/64
U.S. Cl. 356—350 17 Claims

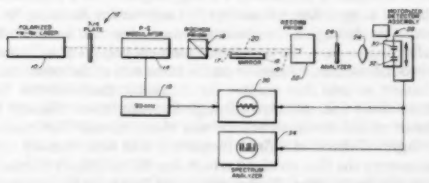


1. A ring interferometer device comprising:
a closed optical loop;
means coupled to said optical loop for splitting a coherent optical radiation into two fractions which travel in opposite directions in the closed loop;
an optical path for transmitting the coherent optical radiation to the splitting means;
filtering means disposed in said optical path for selecting a single one predetermined mode for transmission therethrough;
detector means coupled to said optical path for detecting the interference of the two fractions of radiation traveling in opposite direction in said closed loop;
means for coupling said detector means to said optical path; and
said filtering means disposed between said coupling means and said splitting means such that the coherent radiation passes through said filtering means in opposite directions during travel to said closed loop and from said closed loop to said detector means.

4,480,916
PHASE-MODULATED POLARIZING INTERFEROMETER

Noah Bareket, San Jose, and Wayne W. Metheny, Fremont, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1982, Ser. No. 395,769
Int. Cl.³ G01B 9/02
U.S. Cl. 356—351 3 Claims

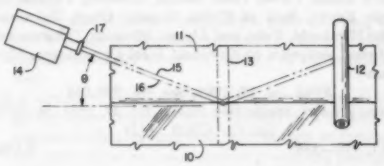


1. Interferometer for measuring the optical path differences representing the surface contour of optical surfaces comprising:
means for producing a beam of polarized radiation,
means for modulating the relative phase of the two polarization states of the optical field of said beam,
means for splitting said modulated beam into two orthogonal components and directing one of the beams onto said optical surface where it is reflected,
means for recombining said two components to produce a single beam,
detector means disposed in a plane perpendicular to the optical path of the single beam for detecting the interference intensity,
circuit means connected to said detector means for providing an output signal proportional to the optical path difference between the two components of the beam,
said circuit means including lock-in amplifier means for providing a first and second signal proportional to the amplitudes of the fundamental and first harmonic components of the detected signal and an output signal that is the ratio of said first and second signals.

4,480,917
FLOAT GLASS RIBBON MONITOR ENHANCEMENT METHOD AND APPARATUS

Hugh E. Shaw, Jr., Crystal City, Mo., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 24, 1982, Ser. No. 351,702
Int. Cl.³ G01N 21/21
U.S. Cl. 356—364 8 Claims



1. A method of detecting the location of an edge of a glass ribbon being formed on a pool of molten metal in a float glass forming chamber, comprising:
sighting optical sensor means at an oblique angle toward a surface of the glass ribbon near an edge thereof and an adjacent portion of the molten metal surface within the forming chamber so as to receive in the sensor a sighted area of the glass and molten metal surfaces including a virtual image of a non-emitting object within the chamber, and passing the image of the sighted area to the sensor through a polarizing filter oriented horizontally, whereby contrast between the glass and the metal is enhanced in the received image.

4,480,918
NON-CONTACT DISPLACEMENT SENSING SYSTEM FOR A COMPLIANCE DEVICE

Thomas L. De Fazio, Watertown, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 4, 1982, Ser. No. 354,807
Int. Cl.³ G01B 5/25
U.S. Cl. 356—373 21 Claims

1. A non-contact displacement sensing system for a remote center compliance (RCC) device having a movable part and a fixed part comprising:
a curved reflector mounted for movement with one of said parts of the RCC device;
radiation source means including at least one radiation source mounted to the other said part of the RCC device and spaced from said curved reflector for providing a beam of radiation to said reflector; and
detector means including at least one detector device

mounted to said other part of the RCC device and spaced from said curved reflector for receiving the reflected

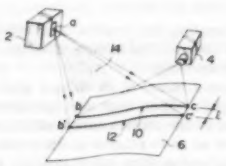
radiation from said radiation source means, and generating output representative of the displacement of the movable part of the RCC device relative to the fixed part.

4,480,919

METHOD AND SYSTEM FOR DETERMINING SHAPE IN PLANE TO BE DETERMINED IN ATMOSPHERE OF SCATTERING MATERIALS

Yuichiro Asano, Chiba; Taira Suzuki, Ichihara; Tadashi Yabe; Kunio Kurita, both of Chiba; Suehisa Ohga, Takarazuka; Akira Hirahashi, Kobe, and Atsushi Momose, Takarazuka, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Jul. 19, 1982, Ser. No. 399,844
Claims priority, application Japan, Jul. 27, 1981, 56-117248
Int. Cl.³ G01B *11/24*
U.S. Cl. 356—376 **3 Claims**



1. A method for determining the shape in a plane to be determined in atmosphere of scattering materials comprising:

scanning a first line to be determined being imagined on said plane to be determined in the atmosphere of scattering materials with light beam having a prescribed scanning rate to extract a first picture signal at the time of picking up said first line to be determined;

scanning a second line to be determined being imagined at a position with a prescribed distance apart from said first line to be determined with light beam having a higher scanning rate than said prescribed scanning rate to extract a second picture signal at the time of picking up said second line to be determined;

subtracting said second picture signal from said first picture signal to extract a fresh picture signal; and

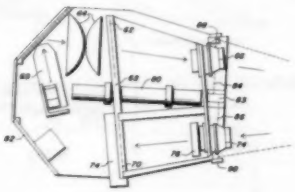
operating two-dimensional position coordinates of a first image of line to be determined on the picture in which said first line to be determined has been picked up on the basis of said fresh picture signal to extract three-dimensional position coordinates of said first line to be determined in said plane to be determined through coordinate conversion of said two-dimensional position coordinates.

4,480,920

FRINGE PATTERN METHOD AND APPARATUS FOR PRODUCING X-RAY DOSAGE COMPENSATING FILTERS

Arthur L. Boyer, New Braunsfels, Tex., and Michael Goitein, Belmont, Mass., assignors to The Massachusetts General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 190,250, Sep. 24, 1980,. This application Aug. 2, 1983, Ser. No. 519,216
Int. Cl.³ G01B *11/24*
U.S. Cl. 356—376 **6 Claims**



6. A camera for producing an image of fringe lines corresponding to gradient line elevations of an object comprising:

a camera housing;

a projection path within said housing including a light source, a first grating illuminated by said light source, and projection means for producing an image of said first grating on said object;

an imaging path including a second grating parallel to said first grating, imaging means for projecting an image of the object through said second grating; and film holder means for receiving image retaining means adjacent said second grating to receive light from said imaging means after passage through said second grating;

grating positioning means containing said first and second gratings in substantially side by side relationship within said housing whereby said projection and imaging paths are substantially adjacent to each other within said housing; and

said projection and imaging means including lenses having identical magnifications on- and off-axis with said projection means adapted to produce said image off-axis and said imaging means adapted to project the object image on-axis.

4,480,921

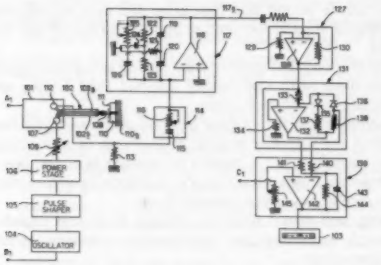
APPARATUS TO REGISTER THE QUANTITY OF SEBUM SECRETED BY A SKIN

Jean-Luc Léveque, Montfermeil, and Gilbert Gras, Aulnay sous Bois, both of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 844,038, Oct. 20, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,717
Claims priority, application France, Feb. 5, 1979, 79 02935
Int. Cl.³ G01J *3/45*
U.S. Cl. 356—434 **12 Claims**

1. Apparatus for registering the quantity of sebum secreted from a region of the skin of a living subject onto a translucent element comprising, a luminous flux emitter for directing luminous flux through a translucent element disposed in front of a reflecting surface, the translucent element being a plate having a ground surface, a receiver on the same side of the translucent element as said flux emitter for receiving the luminous flux transmitted and reflected through the translucent element by virtue of the transparency of said element, said flux emitter being modulated at a fixed frequency, and said receiver only measuring the flux received which has the frequency of modulation of the emitter, the emitter of the luminous flux comprising an electroluminescent diode, and the luminous flux receiver comprising a phototransistor, storage means for storing the value of an output voltage from the receiver resulting from a measurement of a reference specimen, said storage means

comprising a digital storage unit having a register and an analog output, means for subtracting said stored value of voltage from a later output voltage of the receiver resulting from a measurement of a translucent element having sebum deposited thereon, and means for registering the value of the difference between said voltages, the storage unit including a double



analog/digital and digital/analog converter with binary memory, which has an input for receiving a measuring voltage and an output for producing a reference voltage corresponding to its stored binary value, and manually operable means to reset said storage unit and to enable said unit to store a binary value corresponding to a new measuring voltage received.

4,480,922

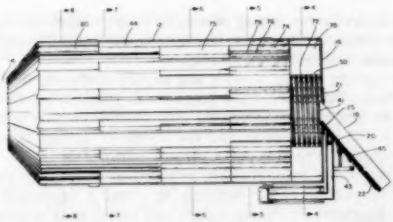
RECYCLING APPARATUS FOR PARTICULATE ASPHALTIC CONCRETE

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Division of Ser. No. 180,297, Aug. 22, 1980, Pat. No. 4,382,682, which is a continuation-in-part of Ser. No. 1,051, Jan. 28, 1979, Pat. No. 4,219,278, Ser. No. 155,502, Jun. 2, 1980, Pat. No. 4,265,546, and Ser. No. 139,640, Apr. 14, 1980, Pat. No. 4,326,809, each is a continuation-in-part of Ser. No. 871,351, Jan. 23, 1978, Pat. No. 4,208,131, and Ser. No. 906,734, May 17, 1978, Pat. No. 4,240,754. This application Dec. 29, 1982, Ser. No. 437,501

Int. Cl.³ B01F *15/02, 15/06;* **B28C** *5/46*

U.S. Cl. 366—25 **10 Claims**



1. An elongated rotatable drum having a first port at a first end thereof for introducing particulate composition and hot gases for heating said composition,

a second port at a second end of said drum for recovering heated composition,

first lifters extending along a first section of the interior of said drum adjacent said first port for substantially preventing a curtain of said particulate composition during rotation of said drum,

second lifters extending along a second section of the interior of said drum adjacent said second port for creating a substantial curtain of said particulate composition during rotation of said drum having a first particulate density, and

third lifters extending along a third section of the interior of said drum, intermediate said first and second sections for creating a curtain of said particulate composition during rotation of said drum having a second particulate density, said second density being less dense than said first particulate density.

4,480,923

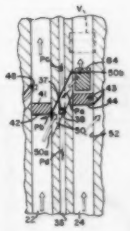
ROTARY PROCESSORS AND SEALS

Pradip S. Mehta, West Haven, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Sep. 14, 1983, Ser. No. 532,165

Int. Cl.³ B01F *7/10*

U.S. Cl. 366—99 **6 Claims**



1. A rotary processor for processing viscous materials and comprising:

(a) a rotatable element comprising a rotor carrying at least first and second annular processing channels extending radially inwardly from the surface of the rotatable element;

(b) a stationary element providing a coaxial closure surface spaced apart from the rotor surface by a clearance and cooperatively arranged with the channels to form at least first and second enclosed annular processing passages, the stationary element also having associated with it an inlet for introducing material to the first processing passage, a blocking member providing an end wall for each passage to collect material processed in the passage for discharge from the passage, an outlet positioned near the end wall of the second processing passage for discharging material from the second processing passage and a material transfer groove interconnecting the first and second processing passages in an in-series relationship and extending from a point near the end wall of the first processing passage to the second processing passage for discharging material from the first processing passage and transferring the discharged material to the second processing passage, and wherein a pressure differential is established between the first and second passages during operation; and

(c) sealing means to control leakage of pressure and material between the first and second processing passages comprising:

(1) an annular sealing groove carried by the portion of the rotor surface between the first and second processing passages, extending over the entire circumference of the rotor surface portion and arranged to pass under the material transfer groove as the rotor rotates;

(2) means to maintain the material transfer groove substantially completely full of viscous material and to maintain the material in the material transfer groove under sufficient pressure to fill the portions of the sealing groove passing under the material transfer groove with pressurized viscous material from the material transfer groove; and

(3) means to maintain the sealing groove substantially completely full of pressurized viscous material and to urge the material radially outward to contact the closure surface over the full circumference of the sealing

groove, so that a live O-ring seal is maintained about the full circumference of the rotor surface, so that leakage of pressure and material between the first and second processing passages is controlled.

4,480,924

STIRRER-MIXER FOR RETORTS IN PARTICULAR, WHEREIN THE INSUFFATION IS CARRIED OUT THROUGH THE STIRRER ITSELF

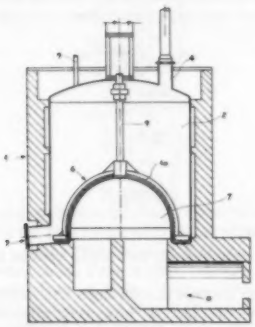
Stefano Preda, via Palermo 17, Trento, Italy

Filed May 13, 1983, Ser. No. 494,347

Claims priority, application Italy, May 13, 1982, 21845/82[U]

Int. Cl.³ B01F *7/16, 13/02, 15/06*

U.S. Cl. 366—102 **7 Claims**



1. Retort which comprises a pressure chamber having a bottom wall of upwardly and inwardly directed rounded shape and a burner arranged below the chamber and adjacent the bottom wall for conveying heat to the chamber at the bottom wall for pressure heat treatment of a material in the chamber, and a stirrer-mixer arrangement including a stirrer operatively disposed in the chamber for stirring such material and having admission means for providing insufflation through the stirrer itself, said admission means comprising at least one pipe portion for supplying a gas under pressure to the interior of the chamber during stirring, said stirrer containing a stirring portion of conforming complementary shape to that of the bottom wall and arranged in overlying relation to the bottom wall for stirring such material.

4,480,925

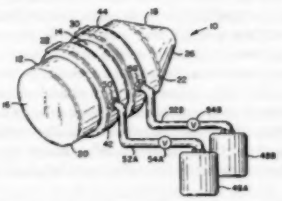
METHOD OF MIXING FLUIDS

David E. Dietrich, 8450-101 Via Sonoma, La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 205,147, Oct. 10, 1980, Pat. No. 4,398,827, and Ser. No. 332,949, Dec. 21, 1981, Pat. No. 4,415,275. This application Aug. 15, 1983, Ser. No. 523,648

Int. Cl.³ B01F *5/00, 13/02, 15/02*

U.S. Cl. 366—107 **26 Claims**



1. A method of mixing fluids, comprising the steps of:

symmetrically injecting a first fluid into a first area of a mixing chamber at a first tangent circle whose radius is smaller than the radius of the mixing chamber, said first fluid having a given angular momentum;

symmetrically injecting a second fluid into said mixing chamber into a second area of said mixing chamber at a second tangent circle whose radius is smaller than the radius of said mixing chamber, said second tangent circle within said second area being spaced from said first tangent circle within said first area, and said second fluid having an angular momentum opposite to that of said first fluid;

intersecting said first injected fluid having said given angular momentum with said second injected fluid having said opposite angular momentum;

counterbalancing the angular momentum of said first fluid against the opposite angular momentum of said second fluid such that the net angular momentum injection rate of all injected fluids is less than the angular momentum injection rate of any given injected fluid,

allowing said mixed fluids to exhaust from said chamber through an exhaust part in a direction transverse to said tangent circles.

4,480,926

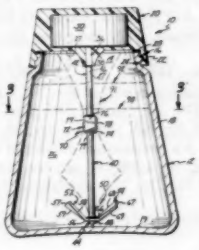
POWDERED FOOD PRODUCT MIXING DEVICE

William F. Lattery, Jr., 10201 Wintergreen St. NW., Coon Rapids, Minn. 55433, and Gary J. Crowther, 2417 Western Ave. North, St. Paul, Minn. 55113

Filed May 13, 1983, Ser. No. 494,174

Int. Cl.³ B01F *7/20*

U.S. Cl. 366—251 **11 Claims**



1. A device for mixing powdered food product and liquid into a whipped consistency and serving, storing and transporting same, the device comprising:

an upright mixing, serving and storing container, the container having a circular bottom wall joined to a generally upright encompassing side wall which is circular in horizontal cross-section and the container having an open upper end portion and a vertical central axis;

a removable cover sealably mounted over the open upper end portion of the container to create a liquid-tight arrangement for mixing, storing and transporting powdered food and product and liquid therein;

motor means mounted with respect to the cover;

a rotatable shaft coupled to the motor means to be rotated thereby and extending sealably outwardly from the cover into the container along the axis of the container when the cover is secured thereon;

first blade means secured to the shaft adjacent a lower end thereof, the first blade means having a first blade section and a second blade section with the blade sections being positioned on opposite sides of the shaft, each blade section of the first blade means having an inner end adjacent to the shaft, an outer end, a leading edge with respect to the direction of shaft rotation and a trailing edge, with each blade section of the first blade means being pitched so that its the leading edge is closer to the cover than its

respective trailing edge and its outer end is closer to said cover than its respective inner end; and

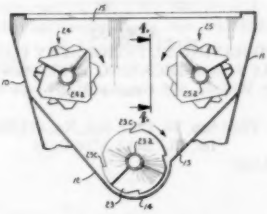
second blade means secured to the shaft above and spaced from the first blade means, the second blade means having a first blade section and a second blade section with the blade sections of the second blade means extending outwardly from the opposite sides of the shaft generally centered on a line generally perpendicular to a line formed by the blade sections of the first blade means, each blade section of the second blade means having an inner end adjacent to the shaft, an outer end, a leading edge with respect to the direction of shaft rotation and a trailing edge, with each section of the second blade means being pitched so that its leading edge is closer to the cover than its respective trailing edge and its outer end is farther from the cover than its respective inner end so that when the motor means is actuated to rotate the rotatable shaft and the first and second blade means fixed thereto, the position and pitch of the blade sections and the circular cross-section of the container combine to create a vortex in the liquid and powdered food product being mixed which induces air to be entrained in the liquid to provide an end product mixture of powdered food product and liquid having a whipped consistency.

4,480,927

MIXING APPARATUS AND AUGER THEREFOR

Robert W. Peat, and John L. Daniel, both of Garden City, Kans., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed May 28, 1982, Ser. No. 383,139
Int. Cl.³ B01F *7/08*
U.S. Cl. 366—299 **8 Claims**



1. A material mixer of the type having a mixing chamber with at least one auger adjacent the bottom of the chamber and a pair of augers above and parallel with said one auger, the improvement wherein:

each of said augers of said pair has a shaft having a central axis and a flighting attached at its inner edge along said shaft, the outer edge of the flighting defined solely as a plurality of contiguous linear segments providing a series of substantially straight edge surfaces for said flighting that are transverse to a radius from the axis of the auger shaft passing through said edge surfaces, said linear edge surfaces defining corner tips for the auger arranged in a helical pattern extending along the auger.

4,480,928

METHODS OF FLAW DETECTION IN BILLETS

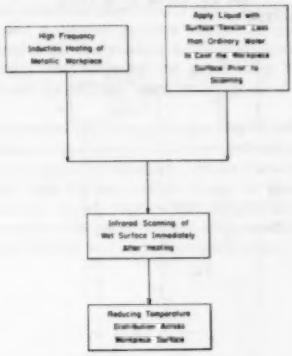
Svein R. Halsor, Bjorkås, and Magnar K. Storset, Hosle, both of Norway, assignors to Elkem a/s, Oslo, Norway

Filed Oct. 28, 1982, Ser. No. 437,251
Claims priority, application Norway, Nov. 3, 1981, 813705
Int. Cl.³ G01N *25/72*
U.S. Cl. 374—5 **5 Claims**

1. In the method of detecting flaws in the surface of metal workpieces which are heated by a high frequency current induction heater and scanned by infrared equipment to record the temperature disturbance across the surface of the workpiece and thereby indicate surface flaws by heat emitted from the surface, the improvement which comprises the steps of:

(a) passing the metal workpiece in longitudinal direction through a high frequency induction heater;

(b) immediately scanning the surface of the workpiece with infrared equipment to record the temperature distribution across the workpiece as it passes from said heater; and


High Frequency Induction Heating of Metallic Workpiece
Apply Liquid with Surface Tension Less than Ordinary Water to Coat the Workpiece Surface Prior to Scanning
Infrared Scanning of Wet Surface Immediately After Heating
Reducing Temperature Distribution Across Workpiece Surface

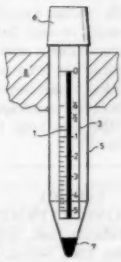
(c) prior to said immediate scanning, applying to the surface of the workpiece water having surface tension below that of ordinary water and of sufficiently low surface tension to wet and coat the surface of the workpiece to be inspected by scanning and thereby change the emission coefficient and compensate for differences in the characteristics of workpiece surfaces.

4,480,929

METHOD AND A DEVICE FOR MEASURING CONCRETE MATURITY

Anker J. Hansen, Jaegervej 11, DK-2791 Dragor, Denmark

Filed Aug. 24, 1982, Ser. No. 410,970
Claims priority, application Denmark, Aug. 28, 1981, 3818/81
Int. Cl.³ G01N *25/00*
U.S. Cl. 374—53 **3 Claims**



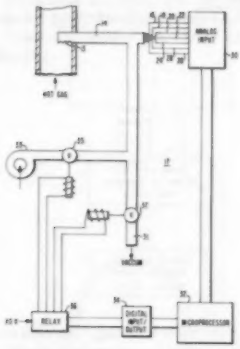
1. A method of determining the maturity of concrete, in which a liquid is heated by means of the heat generated by the setting of the concrete and the evaporated amount of liquid is taken as a measure of the concrete maturity, characterized in that a liquid with an activation energy for vapour pressure of approximately the same value as the activation energy for concrete hardening is contained in an open capillary tube fitted in a closed container to be placed in the concrete, said container containing an absorbing agent which absorbs the vapours developed by the evaporation of the liquid.

4,480,930

PULSE COOLED THERMOCOUPLE SYSTEM FOR HIGH TEMPERATURE MEASUREMENT ESPECIALLY IN COMBUSTION TURBINES

Egon A. DeZubay, Mt. Lebanon, and Kenneth D. Weeks, Acme, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1983, Ser. No. 484,786
Int. Cl.³ G01K 1/16, 13/02
U.S. Cl. 374—134 **6 Claims**



1. A pulsed coolant thermocouple temperature measuring system for industrial apparatus in which the temperature of a hot fluid is to be measured at temperature values up to and above a predetermined thermocouple operating temperature limit, said system comprising a support member having at least one channel therein and being supportable in said hot fluid, a thermocouple unit disposed in said channel and having a junction disposed for sensing the hot fluid temperature, means for directing coolant fluid in proximity to said thermocouple junction to a discharge, means including a coolant valve for selectively controlling the thermocouple coolant flow, computing means for processing and recording measured temperatures from successive thermocouple signals in real time, means for coupling said thermocouple to said computing means, means for coupling said computing means to said coolant valve, said computing means responding to said thermocouple signals to open said coolant valve and cool said thermocouple when the thermocouple temperature reaches a predetermined value, said computing means responding to said thermocouple signals to close said coolant valve to enable a new temperature reading cycle after the thermocouple has been cooled to a lower temperature, and said computing means having means for extrapolating an endpoint temperature corresponding to the actual fluid temperature from the measured temperatures in each temperature reading cycle.

4,480,931

ELECTRONIC TYPEWRITER

Shigeo Kamikura, and Takeshi Itoh, both of Kodaira, Japan, assignors to Silver Seiko, Ltd., Tokyo, Japan

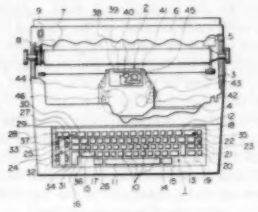
Filed Mar. 9, 1982, Ser. No. 356,382
Claims priority, application Japan, Mar. 16, 1981, 56-37494
Int. Cl.³ B41J 5/30
U.S. Cl. 400—63 **8 Claims**

1. A typewriter having a platen, a printing mechanism for printing characters on a record sheet supported on said platen, bidirectional feeding means for feeding said printing mechanism relative to said platen, a bidirectional line indexing mechanism, a print buffer for storing therein character data being printed on the record sheet, said print buffer being capable of storing therein a predetermined number of lines of characters last printed, and an automatic correction mechanism for addressing said print buffer and for deleting printed characters from the record sheet, comprising:

a line position register responsive to operation of said line indexing mechanism for storing a count indicative of a current line position;

a plurality of line index registers each for storing a count indicative of a print line position;

control means to maintain in said index registers counts corresponding to sequential print lines which include at



least one character printed independently of whether said sequential print lines contain an error;

indicator means for indicating the presence of characters printed in and hence automatically deletable from the current print line on the record sheet; and

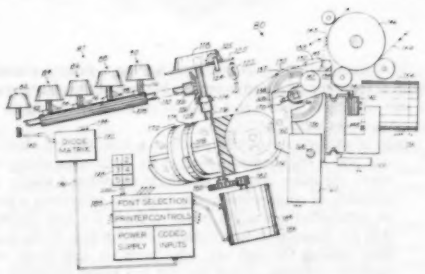
said control means being responsive to operation of said line indexing mechanism successively comparing the contents of said line index registers with the contents of said line position register and for activating said indicator means if coincidence is reached.

4,480,932

KEYBOARD HAVING ROTATIONALLY POSITIONABLE INDICIA FOR INDICATING TYPE FONT IN USE

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn. 06840

Filed Sep. 24, 1982, Ser. No. 422,936
Int. Cl.³ B41J 3/54, 1/56
U.S. Cl. 400—82 **1 Claim**



1. In an electrically controlled and operative printer having a keyboard with keys and a printing mechanism which employs changeable type fonts, each font comprising a different set of type characters arranged in a given order and carried by a type-carrier, a magazine for storing a plurality of said type-carriers at designated positions in a given order, positioning means for said magazine to select a particular type-carrier, and means for transferring a selected type-carrier to the printing machine,

the improvement comprising:

said keys comprising a multiplicity of rotatable keys arranged in rows on said keyboard,

means associated with each rotatable key to select a type

character when the rotatable key is depressed and to effect printing with the selected type character,

each of said rotatable keys having disposed thereon the respective character-defining indicia of at least two selectable sets of indicia, each selectable set defining a character make-up of type characters carried by a type-carrier,

said keys further comprising additional keys, each respective to one of said designated positions,

further means associated with each set of additional keys to select a type-carrier stored in a designated position in said magazine when the respective additional key is depressed,

key rotating means for simultaneously rotating each of said multiplicity of rotatable keys to bring a selected set of indicia into a conveniently readable position, and

connecting means, interconnecting said key rotating means with said positioning means, for conjoint operation when a different type-carrier is selected, to position the magazine for transfer of the selected rotary member to the printing magazine, and to bring the set of indicia corresponding to the type characters carried by the type-carrier into a conveniently readable position,

said connecting means comprising mating interrupted gears having an interrupted portion corresponding to one or more of said designated positions in said magazine so that one or more different type-carriers which require the same respective character-defining indicia on said rotatable keys can be selected without effecting rotation of the rotatable keys.

4,480,933

GUIDING DEVICE FOR PRINTING PAPER STRIP IN A NONIMPACT PRINTER

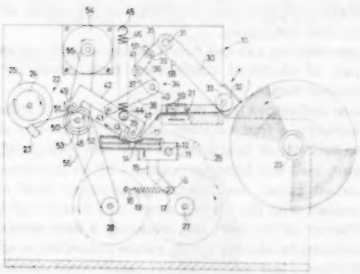
Tooru Shibayama, Sagamihara, and Hiroshi Kajiya, Hachiouji, both of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Apr. 14, 1983, Ser. No. 485,033

Claims priority, application Japan, Apr. 16, 1982, 57-62353

Int. Cl.³ B41J *15/00*

U.S. Cl. 400—120 **13 Claims**



1. In a nonimpact printer, a guiding device for guiding an elongate strip of paper through the printer, comprising:

a printer frame;

a paper strip conveyance path through the printer;

means for conveying the strip of paper along the conveyance path;

an operation member supported by and pivoted on the frame, said operation member being moveable between a first and a second position;

a paper guide member connected with the operation member, said guide member being moveable in synchronism with the operation member to a close position located toward the conveyance path when the operation member is moved to the first position so as to move the paper strip onto the conveyance path, and to a separated position located away from the conveyance path when the operation member is moved to the second position so as to locate the paper strip away from the conveyance path, the separated position of the guide member permitting installation of the paper strip in the printer;

a nonimpact printing head located downstream of the guide member along the conveyance path;

a platen member in opposition to the printing head;

a support member supported by and pivoted on the frame, said platen member being supported on the support member for pivotable movement therewith between an urging position where the paper strip is urged against the printing head, and a divided position where the paper strip is separated from the printing head, said divided position permitting installation of the paper strip between the platen and the printing head;

and

a link mechanism consisting of a plurality of links, said link mechanism constraining said support member for movement in response to movement of the operation member whereby said link mechanism moves the platen member between the urging position and the divided position in synchronism with the movement of the operation member between the first and second positions respectively.

4,480,934

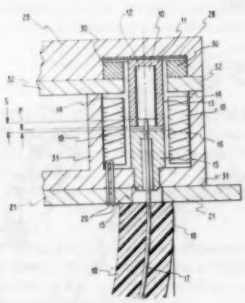
BALLISTIC PRINT WIRE ACTUATOR USING A TELESCOPIC ARMATURE

Richard L. Herman, Sebring, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,683

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **7 Claims**



1. A print wire actuator for propelling a print wire from a zero velocity rest position through a predetermined distance into a recording medium comprising:

an armature assembly including:

a longitudinally moveable armature; and

a movable plunger, fixedly attached to said print wire, and slidably positioned within said armature;

electromagnetic means energizable to propel said armature assembly toward said recording medium;

electromagnetic means energizable to propel said armature assembly toward said recording medium;

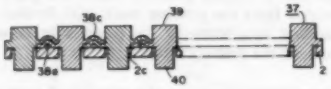
whereby energization of said electromagnetic means propels said armature assembly a first portion of said predetermined distance, and thereafter, propels said plunger, ballistically and magnetically, toward said recording medium through the remainder of said predetermined distance.

4,480,935

PRINTING TYPE DRUM

Hitoshi Kurihara, and Toru Wakazawa, both of Chichibu, Japan, assignors to Canon Denshi Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 284,112, Jul. 16, 1981, abandoned. This application Jun. 9, 1983, Ser. No. 501,748
Claims priority, application Japan, Jul. 23, 1980, 55-99761
Int. Cl.³ B41J 1/22
U.S. Cl. 400—145.2 2 Claims



1. A printing type drum, comprising:

a cylindrical drum body having a circumferential surface with a plurality of through holes arranged in a plurality of circumferential lines along the surface; and

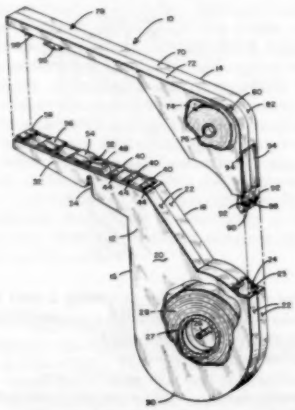
an elastic type belt being formed of a plurality of thin strips, each strip having at least one ridge, with the ridges of adjacent strips placed over and under each other, said elastic type belt having a plurality of type blocks arranged on one side surface thereof and having a plurality of projections on the other side surface thereof, each projection corresponding to a separate one of said plurality of type blocks, said plurality of projections being positioned in said through holes when said plurality of strips is wound round said drum body.

4,480,936

TWO-PIECE TAPE/RIBBON CARTRIDGE

Michael J. Kasun, Stillwater, and David C. Shaffer, Minneapolis, both of Minn., assignors to K-Sun Corporation, Stillwater, Minn.

Filed Jan. 24, 1983, Ser. No. 460,247
Int. Cl.³ B41J 35/28, 15/00
U.S. Cl. 400—207 9 Claims



1. A printing cartridge assembly for use in a lettering machine having a printing station, said printing cartridge assembly containing a tape supply and a printing ribbon supply, said lettering machine causing said ribbon supply to print upon said tape supply, said printing cartridge, comprising:

(a) a first housing member;

(b) a spool of said tape rotatably mounted within and generally enclosed by said first housing member;

(c) a second housing member;

(d) a spool of said printing ribbon rotatably mounted within and generally enclosed by said second housing member;

(e) guide means projecting outwardly from both said first and second housing members; and

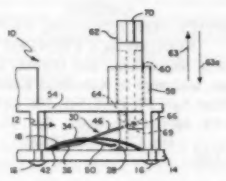
(f) means to enable said ribbon supply to be replaced by a ribbon supply of a different color, said last mentioned means including means for releasably attaching said first housing member to said second housing member so that said second housing member can be replaced with a new second housing member containing a ribbon of a different color, the guide means associated with said first and second housing members orienting said tape and ribbon exiting from said first and second housing members in a face-to-face relationship so that upon entry into said print station of said lettering machine said ribbon can be used to print upon said tape.

4,480,937

BREAKAWAY LEAFSPRING ACTUATED KEYSWITCH APPARATUS

Richard A. Eckhardt, 51 Lockeland Ave., Arlington, Mass. 02174

Filed Aug. 30, 1982, Ser. No. 412,986
Int. Cl.³ B41J 5/08; H01H 21/04, 3/12
U.S. Cl. 400—479 13 Claims



1. Keyswitch apparatus for electronic typewriter keyboards and the like comprising,

means defining a circuit board having at least one associated pair of electrical conductors, each conductor having contact means,

means defining at least one spring and contact system, each including a frame portion adapted for directly mounting to said circuit board and at least one spring and contact unit, each unit being associated with an associated pair of circuit board, conductors, maintaining fixed electrical contact with the contact means of a first one of said conductors of the pair, and including a base section which includes breakaway spring means connected to said frame portion, a leaf spring member cantilevered upwardly from said base section and a contact member cantilevered downwardly from said base section for providing direct electrical contact with said contact means of the second one of the conductors of the pair when a pre-established downward force is exerted on the cantilevered end of the leaf spring member, said base section and said leaf spring member urging said contact member apart from said contact means of the second circuit board conductor of the pair, and

means for depressing the cantilevered end of said leaf spring member to snap said base section and thereby lower said contact member to make direct electrical contact with said contact means of the second circuit board conductor of the pair,

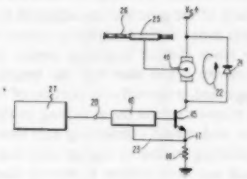
the apparatus being constructed and arranged to afford different force-displacement characteristics on leaf spring member cantilevered end upstrokes and down-strokes, the latter including a sharp breakaway zone.

4,480,938

PRINTER ESCAPEMENT SERVOMOTOR DRIVE WITH A MINIMUM POWER SUPPLY

Darryl R. Polk, and Richard A. Southworth, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,279
Int. Cl.³ B41J 19/00
U.S. Cl. 400—322 6 Claims



1. In a printer having a printhead moved by an escapement, means for accelerating and decelerating the escapement comprising

a fixed current source,

a d.c. servomotor for driving said escapement

means for applying the current from said source to said motor, and

means for controlling the current in said motor comprising

means for comparing a preselected varying motor current profile wherein the current varies inversely with escapement velocity to the actual motor current during escapement acceleration and deceleration,

means for sensing said actual motor current, and

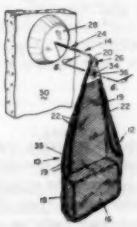
means for feeding back said sensed current to said comparing means.

4,480,939

SOAP HOLDING AND DISPENSING MEANS

Garthop Upton, 1218 Montego, Arroyo Grande, Calif. 93420

Filed Dec. 27, 1982, Ser. No. 453,773
Int. Cl.³ A47K 7/02
U.S. Cl. 401—201 3 Claims



1. Soap holding and dispensing means particularly adapted for holding a bar of soap in hanging suspension in a convenient place for use comprising pouch means having a pocket sized and adapted to receive and contain such a bar, said pocket having a flexible wall formed from a piece of nylon tulle, which piece has been folded upon itself and is shaped to form two walls with side edges adjacent when so folded, said side edges being fastened together to form permanent side closures for said pocket;

said pouch means including a pair of generally triangular flaps formed from said piece of nylon tulle, said flaps being respectively integral with the folded walls of said pocket and extending outwardly therefrom to juxtaposition at their outer ends, the outer ends of said flaps being permanently laminated with each other and with laminar reinforcing means to form a composite laminate and said laminate being provided with an opening therethrough;

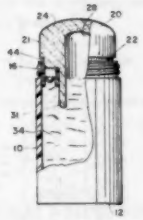
said flaps being sized to provide adequate permanent side entry spaces between said pocket and said laminate to permit a bar of soap to be placed in said pocket.

4,480,940

FLEXIBLE DIAPHRAGM FOR DISPENSING PRODUCT

Keith F. Woodruff, Mountainside, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 368,327, Apr. 14, 1982, abandoned.
This application Dec. 6, 1983, Ser. No. 558,700
Int. Cl.³ A45D 34/00; B05C 17/00
U.S. Cl. 401—206 8 Claims



1. A liquid applicator suitable for use in the application of liquids to a surface of the human body comprising a container having a container body adapted for storing a quantity of liquid, said container having an opening at the upper end thereof; annular spring means said annular spring means comprising outer and inner concentric cylindrical segments joined by an undulate annular planar member, said spring means being positioned in said container, applicator means being secured in said spring means; said annular spring means forming a liquid tight seal between said applicator means and said container body; said applicator means comprising a non-flexible, non-deformable, sintered, porous synthetic resin structure having a controlled porosity and having omni-directional interconnecting pores.

4,480,941

DOUBLE SHEAR ANGLED FASTENER CONNECTOR

Tyrell T. Gilb, Berkeley, and Alfred D. Commins, Livermore, both of Calif., assignors to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Mar. 4, 1983, Ser. No. 472,273
Int. Cl.³ F16B 9/00
U.S. Cl. 403—232.1 15 Claims

1. A sheet metal wood-to-wood structural connector for joining wood members the connection comprising:

a. an elongated wood structural holding member having a generally planar connecting face;

b. an elongated wood structural held member having a generally planar first side face and a generally planar end face in abutting face-to-face contact with said planar connecting face;

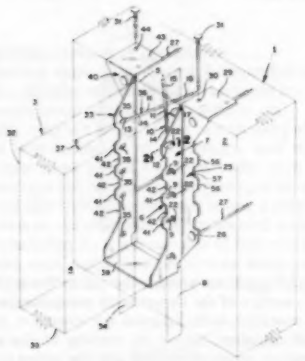
c. said connector having a first metal side member having portions in a first plane engaging said first side face of said held member and formed with a first restricted opening therethrough;

d. a first held-holding fastener for double-shear connection having a shank formed with a head, a head end shank portion, a proximal held shank portion and a distal holding shank portion with said head having a width greater than the width of said first restricted opening in said side member of said connector, adapted for being driven through a portion of said held member and into said holding member so that said distal holding shank portion penetrates a portion of said holding member for secure holding relation by

said holding member and said proximal held shank portion is in secure closely held contact with a portion of said held member;

e. said first held-holding fastener and said first plane of said first metal side form a first selected angle;

f. said first restricted opening is formed with a width slightly larger than the width of said head end shank portion of said first held-holding fastener so that when said first fastener is inserted through said first restricted opening at said first selected angle, the sides of said first restricted opening register with opposed sides of said head end shank portion of said first held-holding fastener and prevent relative movement between said first held-holding fastener and said connector;



g. a first metal header side member integrally attached at an angle to said first metal side member and positioned in engagement with said planar connecting face of said wood holding member and formed with at least one header fastener opening therethrough; and

h. a header fastener for single-shear connection inserted through said header fastener opening joining said metal header side to said holding member and thereby causing said head end shank portion of said first held-holding fastener to be securely held in relation to said holding member, resulting in a reduction in end splitting of said held member due to the relative absense of bending in said proximal held shank portion of said first held-holding fastener under normal design loading.

4,480,942

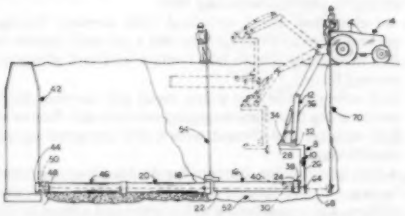
APPARATUS AND METHOD FOR LAYING PIPE

Charles T. Farrow, 208 Florence, Jackson, Mo. 63755

Filed Aug. 25, 1982, Ser. No. 411,451

Int. Cl.[3] **F16L** *1/00*; **B66F** *9/00*

U.S. Cl. 405—154 **22 Claims**



1. A pipe supporting structure adaptable for use on machinery having a movable portion, said structure being attachable to such machinery so as to be used to support a pipe section having inner and outer surfaces while it is moved into position and manipulated for attaching to another pipe section, said structure including an elongated member formed by angularly related arm portions including a first arm portion insertable into the pipe section to be supported from one end, said first arm portion having means thereon for engaging the inner surface of the pipe section to be supported adjacent the upper portion of the inner surface thereof, other means on the elongated member spaced from the means for engaging an upper portion of the inner surface of the pipe section for engaging the upper outer surface of the pipe section adjacent to the one end thereof, said upper outer surface engaging means being spaced from said upper inner surface engaging means such that the distance therebetween is less than half the length of the pipe section to be supported, a second arm portion of the elongated member having means thereon for attaching to the machinery for moving same, and means connecting said first and second arm portions including means to engage one end of the pipe section when said one arm portion is moved therein to limit penetration of said one arm portion.

4,480,943

METHOD AND APPARATUS FOR LAYING UNDERWATER COVERINGS

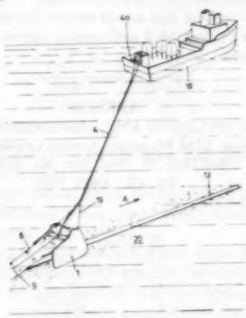
Hermann Leuenberger, Steffisburg, Switzerland, assignor to Losinger AG, Bern, Switzerland

Filed Jul. 12, 1982, Ser. No. 397,197

Claims priority, application European Pat. Off., Apr. 8, 1982, 82810156.8

Int. Cl.[3] **E02D** *15/06*; **F16L** *1/00*

U.S. Cl. 405—172 **12 Claims**



1. A method of laying a covering over a submerged structure or on a subaqueous piece of ground on the bed of a body of water, of the type wherein the covering is formed by controllably filling a flexible casing lying directly over the structure or piece of ground with a substance under pressure from a vessel on the surface of the body of water, wherein the improvement comprises the steps of:

disposing a web of casing material in or on a supply contrivance associated with a support secured to a vehicle movable over said structure or piece of ground along the bed of the body of water by the surface vessel,

causing the web to be continuously withdrawn from the supply contrivance onto the support,

continuously joining the long edges of the web to form a said casing having a closed cross-section,

filling the casing with said substance, and

causing the filled casing acted upon by the force of gravity and the movement of the support along the bed of the body of water by the surface vessel to slide toward the structure or piece of ground and to be laid continuously thereon as a said covering.

4,480,944

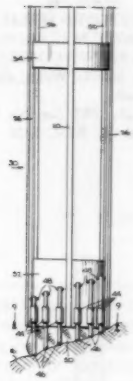
OFFSHORE DRILLING OF LARGE DIAMETER HOLES IN ROCK FORMATIONS

Lindsey J. Phares, Sugar Land, Tex., assignor to Raymond International Builders, Inc., Houston, Tex.

Division of Ser. No. 259,046, Apr. 30, 1981,. This application Jul. 6, 1983, Ser. No. 511,539

Int. Cl.[3] E02D *5/34*

U.S. Cl. 405—223 2 Claims



1. In a large diameter offshore drill rig of the type wherein drilling is carried out from a platform supported above the sea surface by legs which extend down to the sea bottom, the combination comprising a drill guide extending down from the platform to a rock outcropping on the sea bottom, a tubular form at the lower end of said drill guide, a flexible container extending down from the lower edge of said form and reinforcing elements distributed about said form near its lower edge outside said flexible container and mounting means for mounting said reinforcing elements on said form for free vertical movement so that said reinforcing elements will automatically adjust themselves to the contours of said rock outcropping, said reinforcing elements comprising spaced apart rods and said mounting means comprising tubular sleeves through which said rods may freely move, said rods having stops at their upper ends to prevent them from falling through the sleeves, said rods serving to limit expansion of said flexible container when concrete is poured into it through said tubular form.

4,480,945

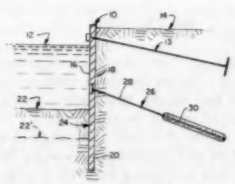
METHOD OF REINFORCING AN EXISTING EARTH SUPPORTING WALL

Harry Schnabel, Jr., Bethesda, Md., assignor to Schnabel Foundation Company, Bethesda, Md.

Filed Apr. 20, 1982, Ser. No. 370,250

Int. Cl.[3] E02D *29/02;* E21D *20/02*

U.S. Cl. 405—262 7 Claims



1. A method of reinforcing an original existing bulkhead wall located between a body of water and land, without installing a new wall in front of the bulkhead wall, wherein the original bulkhead wall is designed to support the earth at an orginal earthen floor level and the earthen floor adjacent the bulkhead wall is to be deepened from its original level to a new deeper level which is above the lowermost end of the bulkhead wall, said bulkhead wall having a first side facing the body of water, an opposite second side in contact with ground and a lower toe portion embedded in the earthen floor beneath the body of water, comprising the steps of:

(a) drilling beneath the surface of the water one or more holes through the existing bulkhead wall for the insertion of one or more tiebacks; and

(b) installing a sufficient number of tiebacks through the holes drilled in said existing bulkhead wall below the water surface to provide a stabilizing force to the wall sufficient to support the increased earth pressure when the earthen floor level is deepened.

4,480,946

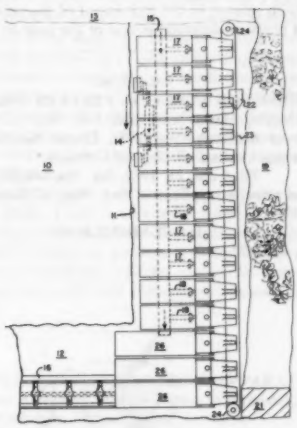
GOB CANOPY FOR A MINE ROOF SUPPORT

Jay H. Kelley, 300 Maple Dr., Greensburg, Pa. 15601

Filed Oct. 19, 1981, Ser. No. 312,250

Int. Cl.[3] E21D *15/14, 15/52, 17/02*

U.S. Cl. 405—293 10 Claims



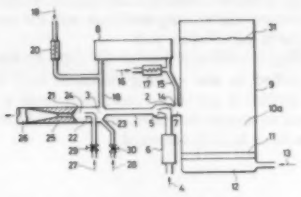
1. A mine roof support including the combination of a base for support by a mine floor, a roof canopy generally overlying said base with a forward roof canopy portion extending forward beyond a forward toe portion of said base, hydraulically-extendible prop means between said base and said roof canopy to support and move said roof canopy relative to a mine roof above said mine floor, gob canopy means extending rearward of said roof canopy in a generally planar fashion for forming a roof-bearing rearward extension to said roof canopy, hinge means including horizontal and vertical pivots interconnecting said gob canopy means with a rear portion of said roof canopy which is opposite said forward roof canopy portion for cantilevered pivotal movements of said gob canopy means at a rear portion of said roof canopy, and hydraulic actuator means between said gob canopy means and said base for angularly adjusting the gob canopy means to move about said pivots toward and away from said mine roof and generally parallel thereto relative to said roof canopy.

4,480,947

POWDER FLOW RATE MEASURING APPARATUS

Hideo Nagasaka, 389-7, Minamitakano-machi, Hitachi-shi, Ibaraki-ken, Japan

Filed Jun. 14, 1982, Ser. No. 388,084
Claims priority, application Japan, Jun. 17, 1981, 56-93542
Int. Cl.[3] B65G 53/66; G01F 1/37, 1/74
U.S. Cl. 406—14 16 Claims



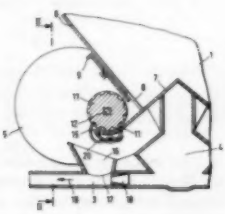
1. A powder flow rate measuring apparatus, characterized in that said apparatus comprises a detecting pipe line having an inlet and an outlet, a nozzle for injecting only a conveying fluid into the inlet of said detecting pipe line, a powder source and means for introducing a powder material to the conveying fluid discharged by the said nozzle, means for controlling the flow rate of the conveying fluid to be fed to said nozzle, a pressure differential detecting means communicating with both the inlet and outlet of the detecting pipe line for monitoring differences in fluid pressure between the outlet end and the powder inlet end of said detecting pipe line, said detecting means communicating with the inlet end upstream of said nozzle with respect to the movement of the powder whereby the inlet pressure detected is that of the powder source.

4,480,948

MACHINE FOR APPLYING PELLETS AND POWDER

Heinz Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany, assignor to Amazonen-Werke H. Dreyer GmbH & Co. KG, Hasbergen-Gaste, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,209
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129235
Int. Cl.[3] B65G 53/46
U.S. Cl. 406—52 6 Claims



1. In a machine for applying material in the form of pellets and powder to the soil, having a reservoir with outlets for holding the material to be applied, wheels having ridges on the peripheral surface thereof and with base plates therebelow and rotated by a drive shaft at varying rates for distributing uniform volumes of the material, flowing out of the reservoir through the outlets, into exit pipes that communicate with a blower and that have outflow openings, the improvement wherein the ridges curved smoothly and are disposed one after the other in the direction of rotation of the wheels and the base plates are disposed at the bottom of the wheels, each base plate having an arcuate portion configured in accordance with the circumference of the wheel and disposed adjacent to the bottom of the wheel and further comprising scraping means disposed in engagement with the wheels for scraping out the depressions between the ridges of the wheels, the scraping means comprising U-shaped bent wires each having a front end and two legs and wherein the front end only is in contact with the wheel ridges and continuously follows the contour of the wheels to extend to the bottom of the depressions during rotation of the wheels.

4,480,949

COMBINATION OPPOSED HELIX ROUTER FOR ROUTING COMPOSITE MATERIAL FACE SHEETS HAVING HONEYCOMB CORE

Lloyd J. Van De Bogart, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 28, 1982, Ser. No. 383,374
Int. Cl.[3] B23C 5/10
U.S. Cl. 407—54 1 Claim

1. A router having a shank end and a cutting portion, said cutting portion including:

a lower section having two cutting edges ground on a right-hand helix angle one-fourth inch in length, having a 10 degree primary clearance angle of 0.020 inch width land, and a secondary clearance angle, the area behind said secondary clearance providing clearance for a further cutting edge; and,

an upper section disposed between said lower section and said shank end, said upper section having multiple cutting edges ground on a 70 degree left-hand helix, a 20 degree primary clearance angle of 0.030 inch width, and a 30 degree secondary clearance angle with 10 degree positive rake angle 0.040 inches in depth; and

said lower section including an end portion ground with 10 degree primary clearance angle and 0.020 inch width land, a 20 degree secondary clearance angle, and 10 degree dish angle.

4,480,950

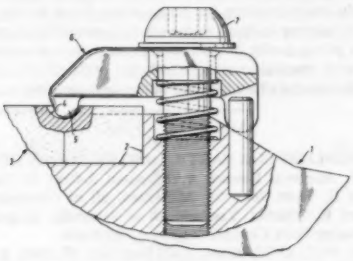
CUTTING TOOL

Harald Kraft, Uhingen, and Peter Leimanis, Altbach, both of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,463
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136549
Int. Cl.[3] B26D 1/00
U.S. Cl. 407—103 10 Claims

1. A cutting tool, such as a turning tool, comprising a clamping holder having a recess therein, a cutting bit insertable and securable within said recess, said cutting bit having a depression in the surface of said bit facing outwardly from said recess, a clamping shoe mounted on said clamping holder, a projecting member located on and extending outwardly from said clamping shoe so that said projecting member is arranged to engage within said depression for securing said cutting bit on said clamping holder, means for securing said clamping shoe to said clamping holder, said depression is defined in the surface of said cutting bit by a closed line forming the edge of said depression and including at least two convexly curved first lines, each

of said first lines being spaced apart from the other and each having a pair of ends with the ends spaced apart from the ends of the at least other said first line, and second lines each extending between and interconnecting one end on each of two of the spaced said first lines and forming, in combination with said first lines, said closed line, the surface of said depression within said closed line is formed by a radius with the center of the



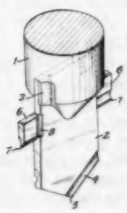
radius spaced outwardly from the surface of said cutting bit containing said closed line so that said radius is longer than the maximum depth of said depression, and said projecting member on said clamping shoe is shaped so that when it is placed in contact with the surface of said depression inwardly of said closed line it is only in punctiform contact with the surface of said depression and the surface of said depression contacted by said projecting member is defined between said second lines.

4,480,951

SELF-DRILLING SCREW

Werner Regensburger, Widnau, Switzerland, assignor to SFS Stadler AG, Heerbrugg, Switzerland

Filed Sep. 22, 1981, Ser. No. 304,624
Claims priority, application Austria, Sep. 30, 1980, 4887/80
The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.
Int. Cl.³ F16B *25/00*
U.S. Cl. 408—224 **18 Claims**



1. Self-drilling screw comprising an axially extending cylindrically shaped screw shank having a leading end and a trailing end spaced apart in the axial direction thereof, a drill bit formed of a plate-shaped piece of material separate from that of said screw shank and secured to and extending axially outwardly from the leading end of said screw shaft, said drill bit having a leading end arranged to engage and cut the surface to be drilled and a trailing end spaced in the axial direction of said screw shank from the leading end of said drill bit and secured to the leading end of said screw shank, said drill bit having at least one wing spaced axially from the leading end thereof and extending laterally outwardly therefrom transversely of the axial direction of and projecting outwardly beyond the outside diameter of said screw shaft, and said wing having a cutting edge thereon facing toward the leading end of said drill bit and extending transversely of the axial direction of said screw shank.

4,480,952

NON-BURRING DRILL FOR COMPOSITE MATERIALS

Robert W. Jeremias, 1934 N. Vermont, Royal Oak, Mich. 48073

Filed Oct. 5, 1981, Ser. No. 308,712
Int. Cl.³ B23B *51/00, 51/08*
U.S. Cl. 408—224 **9 Claims**

1. A drill for drilling holes in fiber filled composite materials having a shank, a relatively blunt cutting tip portion extending from a forward cutting end of the shank, a relatively acute reaming portion extending rearwardly from an end of the tip portion remote from the cutting end of the shank and a means for shearing fibers including a cylindrical portion of substantially the diameter of the hole to be drilled, and a succeeding diametrically reduced portion, the cylindrical portionextending from an end of the reaming portion most remote from the cutting end and terminating at said succeeding diametrically reduced portion of the shank, the rearwardly facing end of the cylindrical portion forming a full circular rearwardly facing cutting edge symmetrically disposed about a longitudinal axis of the shank and lying in a plane substantially normal to the axis whereby fibers may be sheared off upon retraction of the drill through the hole.

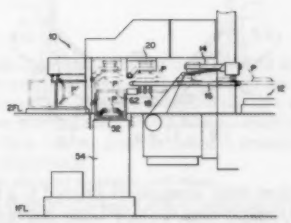
9. A drill for drilling holes in fiber filled composite materials comprising a shank, a drill head coaxial with said shank, said drill head having a rearward coaxial cylindrical portion and a forward coaxial cutting tip portion, a diametrically reduced coaxial portion in said shank, a planar rearwardly facing circular cutting edge formed by said reduced portion and said cylindrical portion.

4,480,953

MULTIPLE MODE PALLETIZING APPARATUS

Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,395
Claims priority, application Japan, May 17, 1982, 57-81617
Int. Cl.³ B65H *31/06, 31/22, 31/32*
U.S. Cl. 414—27 **5 Claims**



1. Apparatus for loading generally flat articles, either aper-

tured or nonapertured, on pallets in any of several different modes depending upon the physical characteristics of the articles, comprising:

(a) a conveyor for transporting in a recumbent attitude a succession of articles to be palletized from a supply station to a pickup station;

(b) a loader for picking up one article at a time from the conveyor at the pickup station and carrying the article to a loading station away from the conveyor, the loader releasing the article either in the recumbent attitude or, after turning the article through an angle of 90 degrees, in an upstanding attitude;

(c) a controlled flatwise loading mechanism for receiving the successive articles released recumbently from the loader and successively depositing the articles flatwise on a pallet at the loading station;

(d) a retractable fork assembly for use in loading the articles from the loader onto a pallet at the loading station in a free-fall flatwise loading mode, the fork assembly being held in a working position at the loading station for receiving the articles released recumbently from the loader during each change from a loaded pallet to an empty pallet;

(e) an insert loading mechanism for receiving the articles released upstandingly from the loader and loading the articles on a pallet having erected thereon a plurality of uprights having arms extending horizontally from their top ends to engage in apertures in the articles;

(f) the pallet with the uprights being also adapted to allow the successive articles released upstandingly from the loader to be loaded edgewise thereon by leaning against the uprights.

4,480,954

BOTTOM DUMP ARRANGEMENT

Hilding Manström, Luleå, Sweden, assignor to Luossavaara-Kiirunavaara AB, Stockholm, Sweden

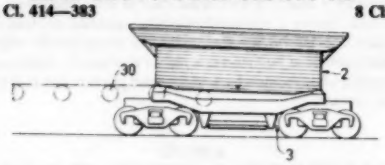
PCT No. PCT/SE80/00341, § 371 Date Aug. 13, 1981, § 102(e) Date Aug. 13, 1981, PCT Pub. No. WO81/01819, PCT Pub. Date Jul. 9, 1981

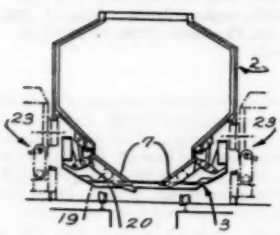
PCT Filed Dec. 18, 1980, Ser. No. 293,204

Claims priority, application Sweden, Dec. 20, 1979, 7910528

Int. Cl.[3] **B65G** *67/30*; **B61D** *7/32, 9/14, 7/22*

U.S. Cl. 414—383 **8 Claims**





1. A bottom dump arrangement attached to a body which provides a goods-holding space, said body resting on an undercarriage and comprising at least one pair of adjacent doors having remote edges and free edges, said doors being pivotally attached to a linkage means at their remote edges for swinging movement in a curved path transverse to said body and perpendicular to said remote edges, the free edges of the doors facing toward each other abutting each other in a closed position of the doors, the arrangement also comprising means forming guide paths that cooperate with the body to lift the body relative to the undercarriage to thereby move the doors to an open position; characterized in that said linkage means is pivotally connected between the undercarriage, the doors and the body for permitting the body, when lifted by the guide paths, to become inclined to the pivotal axes of the doors in a vertical plane, as the doors move to said open position, said plane being parallel to said pivotal axes of the doors and perpendicular to the plane that the undercarriage rests on.

4,480,955

COUPLING FOR EARTH MOVING TOOLS ETC.

Errol F. Andrews; Edward A. Peterson; Jeffrey N. Casbolt; Kevin E. Holt; John M. McMillan, all of Nambour, and Robert E. Whiting, Yandina, all of Australia, assignors to Maroochy Shire Council, Nambour, Australia

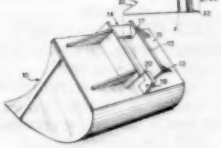
PCT No. PCT/AU82/00004, § 371 Date Sep. 27, 1982, § 102(e) Date Sep. 27, 1982, PCT Pub. No. WO82/02731, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 2, 1982, Ser. No. 432,949

Claims priority, application Australia, Feb. 5, 1981, PE7482

Int. Cl.[3] **E02F** *3/96*

U.S. Cl. 414—723 **7 Claims**



1. A quick release and attachment assembly for an earthmoving or excavating machine or the like comprising:

a first attachment means including a base (**11**), at least two opposed stop members (**14, 19**) fixed on the base, and locating means (**12**) on the base (**11**), said locating means (**12**) including a pair of laterally spaced, parallel side plates (**12**) fixed on the base (**11**), one of said stop members (**14**) extending transversely between said side plates (**12**) to provide a large surface area of contact; and

a second attachment means including an attachment head (**23**) having parallel, side plates (**26**) and an interconnecting base plate (**25**) and rear wall (**30**), said side plates (**26**) fitting closely within the side plates (**12**) of the first attachment means thereby to prevent lateral movement of said second attachment means when mounted on said first attachment means, a fixed stop engagement means (**33**) on the attachment head (**23**) extending laterally between said side plates (**26**) thereof and adapted to engage said one (**14**) of the stop members, said fixed stop engagement means (**33**) presenting a relatively large surface area of contact, with the respective surface areas being such that wear is readily compensated for; a movable stop engagement means (**39**) on the attachment head (**23**) movable between a first position engaging the second (**19**) of the stop members and a second position released from the second stop member (**19**), said movable stop engagement means (**39**) and said second stop member (**19**) having mating wedge surfaces to provide tight locking of one within the other and also to compensate for any wear at such mating surfaces, and means (**42**) to move the movable stop engagement means (**39**);

one of the attachment means being connectable to the earth-moving or excavating machine (24) and the other attachment means being connectable to an operating tool (10) for the machine.

4,480,956

TURBINE ROTOR BLADE FOR A TURBOMACHINE ESPECIALLY A GAS TURBINE ENGINE

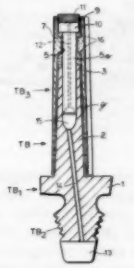
Wolfgang Krüger, Reichertshausen, and Werner Hüther, Karlsfeld, both of Fed. Rep. of Germany, assignors to Mortoren-und Turbinen-Union, Munich, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,117

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203869

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—97 A **15 Claims**



1. A turbine rotor blade comprising a metallic, structural core, a ceramic jacket surrounding said core with spacing therebetween, said jacket being engaged on said core from above, pin means engaging said jacket and core for releasably securing said jacket on said core, a porous abradable coating on said pin means projecting beyond said jacket to form an outer end for the rotor blade, duct means in said core and said pin means for conveying coolant to said abradable coating via said core and said pin means, said jacket including an outer end portion extending beyond said core, said coating projecting beyond said outer end portion of the jacket, a crossweb defining a recess above said crossweb, said pin means passing with clearance through said crossweb and including end means comprising a head in said recess, said coating being on said head, separable means connecting said pin means to said core, said head of said pin means holding said jacket on said core such that separation of said pin means and core enables said jacket to be removed from said core, thermal insulation means between said jacket and said core and pin means, and a metal jacket interposed between said ceramic jacket and said core, said metal jacket having an outer surface conforming to the inner surface of said ceramic jacket and an inner surface forming a second duct means with said core for passage of coolant to cool said core.

4,480,957

DYNAMIC RESPONSE MODIFICATION AND STRESS REDUCTION IN DOVETAIL AND BLADE ASSEMBLY

Manubhai M. Patel, Clifton Park, and Diether E. Carreno, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,882

Int. Cl.³ F01D *5/32*

U.S. Cl. 416—220 R **9 Claims**

1. A rotating component comprising:

a wheel;

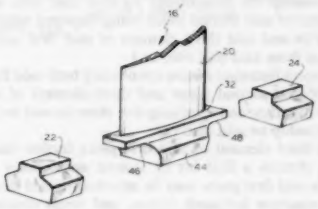
at least one dovetail slot in a peripheral surface of said wheel;

at least one rotor blade;

said rotor blade including an aerodynamic portion and a dovetail;

said dovetail being fittable within said dovetail slot for cantilevered support of said aerodynamic portion radially outward from said wheel;

a removed portion of said dovetail within said dovetail slot, said removed portion being effective to form a platform portion on said dovetail adjacent a root portion of said aerodynamic portion, said platform portion being substantially unsupported by said dovetail slot;



at least one of an extent and a location of said platform portion being effective for modifying a support of said dovetail by said dovetail slot, as compared to a dovetail not containing a removed portion, whereby a stress in said rotor blade is modified as compared to a rotor blade not containing a removed portion in a dovetail slot thereof; and

at least one damping mass loosely fittable into said dovetail adjacent said removed portion, said damping mass including means for frictionally damping motion of at least a portion of said rotor blade.

4,480,958

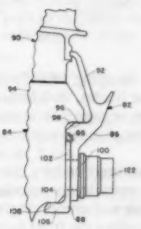
HIGH PRESSURE TURBINE ROTOR TWO-PIECE BLADE RETAINER

Ronald E. Schlechtweg, Fairfield, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 9, 1983, Ser. No. 465,213

Int. Cl.³ F01D *5/32*

U.S. Cl. 416—220 R **5 Claims**



1. In combination with a turbine rotor disc and at least one turbine blade mounted in a peripheral rim of said disc such that a cavity is formed between said blade and said disc and opens at least at one side thereof, a blade retainer, comprising:

(a) a first blade loading piece including in serially interconnected relationship:

(i) a first element engaging said blade,

(ii) a second element abutting a first shoulder on said disc rim and anchoring said blade loading piece against centrifugal forces generated during rotor disc rotation, and

(iii) a third element for attachment of said blade loading

piece to said disc rim so as to impose a vibration-dampening load force on said blade via said first element;

(b) a second cavity sealing piece separate from said first piece and including in serially interconnected relationship:

(i) a first member closing said cavity at least at said one side thereof and for attachment of said cavity sealing piece to said rim, and

(ii) a second member anchoring said cavity sealing piece against centrifugal forces generated during rotor disc rotation;

(c) said third element of said first piece and said first member of said second piece being disposed in an overlapped relationship for attachment to said disc rim, said first member of said second piece being disposed adjacent said disc rim and said third element of said first piece being spaced from said disc rim; and

(d) common fastening means connecting both said first member of said second piece and third element of said first piece together and attaching the same in said overlapped relationship to said disc rim;

(e) said third element of said first piece further having defined therein a first set of spaced apart holes through which said first piece may be attached to said disc rim by said common fastening means, and stress concentration reducing means for relieving stress concentration in the region of said holes.

4,480,959

DEVICE FOR DAMPING VIBRATIONS OF MOBILE TURBINE BLADES

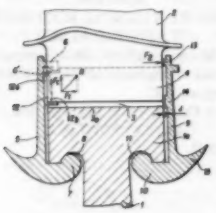
Serge P. L. Bourguignon, Saint Sauveur sur Ecole; Raymond R. Choque, Hericy, and Lucien P. Pham, Le Mee sur Seine, all of France, assignors to S.N.E.C.M.A., Paris, France

Filed Mar. 14, 1983, Ser. No. 475,117

Claims priority, application France, Mar. 12, 1982, 82 04154

Int. Cl.³ F01D *5/32*

U.S. Cl. 416—220 R **2 Claims**



1. A device for damping vibrations of at least first and second mobile turbine blades, in which the roots of the first and second blades are engaged in recesses distributed over the periphery of a rotor disk having a plurality of teeth, comprising:

a first flange anchored under a first rim portion of said disk and which is operatively associated with a leading edge face of the disk and comprising sections that extend radially outward before the front faces of not greater than first and second adjacent blade roots;

a second flange mounted under a second rim portion of said disk and which is operatively associated with a trailing edge face of said disk and comprising a single annular part, a portion of which extends radially outward a distance sufficient that the blade feet may contact it; and

a shim member positioned between the root of the first blade and the bottom portion of one of said recesses in the disk, also being positioned behind the first flange, said shim member being in the shape of a wedge, which, under the action of centrifugal force, exerts on the first blade a force that causes the first blade to slide axially so as to exert a force on said second flange,

wherein said second flange further comprises a first rib for contacting the root of said first blade and a second rib separated by a predetermined clearance from the trailing edge of the disk.

4,480,960

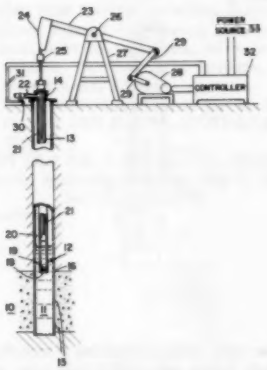
ULTRASENSITIVE APPARATUS AND METHOD FOR DETECTING CHANGE IN FLUID FLOW CONDITIONS IN A FLOWLINE OF A PRODUCING OIL WELL, OR THE LIKE

Stephen F. Strelb, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 5, 1980, Ser. No. 184,558

Int. Cl.³ F04B *49/02, 49/06, 49/00*

U.S. Cl. 417—12 **7 Claims**



1. Apparatus for controlling the operating of an oil well pump comprising transducer-meter means for sensing transient heat flux corresponding to abnormal change in oil flow within a flowline of a wellhead, said means being located completely exterior of the flowline and generating an electrical signal based on the thermopile principle proportional to said sensed transient heat flux, without use of an external power source therefor, and controller means in electrical contact with said transducer-meter means and selectively responsive to said well pump when said abnormal change in oil flow occurs.

4,480,961

SWASH PLATE TYPE COMPRESSOR WITH A MALFUNCTION DETECTOR

Hiroya Kono; Jun Hasegawa; Hiroyuki Deguchi, and Hisao Kobayashi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Nov. 5, 1982, Ser. No. 439,642

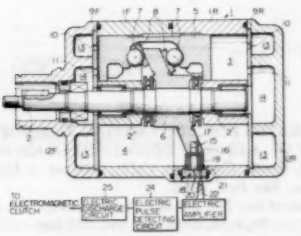
Claims priority, application Japan, Nov. 11, 1981, 56-180910

Int. Cl.³ F04B *49/02, 49/06, 1/26*

U.S. Cl. 417—15 **5 Claims**

1. A swash plate type compressor with a malfunction detector, including a combined cylinder block comprising a pair of front and rear cylinder blocks axially combied with each other; a rotatable drive shaft centrally extending through said combined cylinder block, said rotatable drive shaft being connectable to a drive source via an electromagnetic clutch; a plurality of cylinder bores formed in said combined cylinder block so as to be arranged around said rotatable drive shaft; a plurality of compressor pistons slidably fitted in said plurality of cylinder bores; a swash plate chamber in the approximately middle portion of said combined cylinder block; and a swash plate in said swash plate chamber rotatably supported on said drive shaft, said swash plate causing reciprocal motions of said compressor pistons, wherein said malfunction detector comprises: a

detected means having a thermosensitive element embedded in part of an outer periphery of said swash plate and a permanent magnet element embedded inwardly from and arranged adjacent to said thermosensitive element; and a detecting means having a fixed magnet means fixedly arranged in said combined cylinder block at a position where said detecting means comes face to face with said detected means once per each revolution of said swash plate, and an electric coil wound around said magnetic means, and adapted for issuing an electrical signal in response to increase of magnetic flux density on each approach



of said permanent magnet of said detected means to said fixed magnetic means thereof during rotation of said swash plate, said thermosensitive element of said detected means being arranged for normally, magnetically coupling said permanent magnet to said fixed magnetic means of said detecting means on each said approach of said permanent magnet to said fixed magnetic means thereby to cause a large increase of magnetic flux density, and for magnetically decoupling said permanent magnet from said fixed magnet means when the temperature of the compressor is excessive.

4,480,962

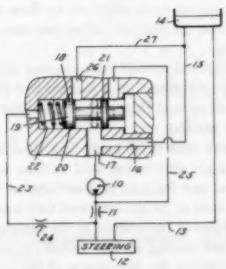
PUMP WITH INLET PASSAGES DOWNSTREAM AND THROUGH ITS FLOW CONTROL VALVE

Albin J. Niemiec, Sterling Heights, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Continuation of Ser. No. 177,369, Aug. 11, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 423,460

Int. Cl.³ F04B *49/08*

U.S. Cl. 417—53 **3 Claims**



1. A power transmission comprising a fixed displacement pump adapted to be driven by a prime mover operable at variable speeds in a hydraulic system, where it is desired to have a predetermined volumetric flow to a load, said pump including at least a pumping region having an inlet and an outlet, a first tank line including at least a first tank passage to the inlet of the pumping region and a flow control valve including a valve bore receiving a spool having a land operable to return a portion of the hydraulic fluid from the outlet of said pump through a return line to the inlet of said pumping region, the land moving to a position where the return flow through the return line extends between said land and the valve bore into the inlet and aspirates hydraulic fluid from the first tank passage, characterized in that a second tank line is provided upstream of the first tank passage having an auxiliary passage which extends only through the flow control valve and therethrough and is at all times in communication with the inlet.

4,480,963

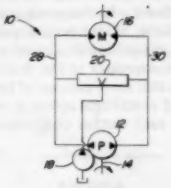
PUMP SWASHPLATE CONTROL ASSIST

Curtis P. Ring, Calgary, Canada, assignor to Deere & Company, Moline, Ill.

Filed Nov. 22, 1982, Ser. No. 443,416

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—216 **11 Claims**



1. A hydraulic pressure pump stroking assist for use with a hydraulic pump having intake and output ports, movable means for varying pump displacement, servo means for controlling the position of the movable means, and control valve means for controlling the flow of pressurized fluid to and exhaust of fluid from the servo means, the stroking assist comprising:

charge means for providing a pressurized charge fluid;

charge valve means for communicating the charge means with the pump intake port and for preventing communication between the charge means and the pump output port; and

differentiating means for receiving fluid pressure from the charge means, from the pump intake port and from the pump output port and for communicating the higher of said pressures to the control valve means, the differentiating means including first, second and third check valves, a first passage directly communicating charge fluid from an inlet of the charge valve to the first check valve, a second passage communicating only the pump intake port to the second check valve, a third passage communicating only the pump output port to the third check valve and a fourth passage communicating all of the check valves to the control valve means.

4,480,964

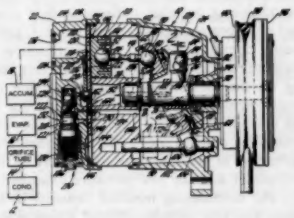
REFRIGERANT COMPRESSOR LUBRICATION SYSTEM

Timothy J. Skinner, Spring Valley, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 352,087, Feb. 25, 1982, abandoned. This application Aug. 26, 1983, Ser. No. 526,676

Int. Cl.³ F04B *1/26, 1/16, 1/18;* **F25B** *1/02*

U.S. Cl. 417—222 **4 Claims**



1. In a variable displacement refrigerant compressor having

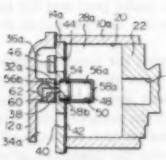
a crankcase containing the compressor's operating mechanism, compression chambers each with a suction valve for admitting gaseous refrigerant with entrained lubricant thereto from a suction cavity and a discharge valve for delivering the refrigerant therefrom to a discharge cavity, and a displacement control valve means responsive to at least suction pressure that operates on at least a vent passage between the compressor's crankcase and the suction cavity so as to control the crankcase pressure relative to the suction pressure to thereby control the compressor displacement: the improvement comprising lubrication-vent passage means in said vent passage for venting the crankcase pressure to the suction cavity between rotating bearing surfaces of the compressor's operating mechanism to thereby lubricate the bearing surfaces by entrained lubricant while also causing some of the entrained lubricant to be separated by centrifugal action at said bearing surfaces and returned to the crankcasé for further compressor lubricant usage and whereby the amount of lubricant actually delivered to the compressor suction cavity from the crankcase and available for discharge from the compressor at the discharge cavity is substantially reduced so that some amount of lubricant returned to the crankcase by said centrifugal action is retained therein and always available for such further compressor lubrication.

4,480,965

CAPACITY MODULATION DEVICE FOR COMPRESSOR

Yutaka Ishizuka, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1982, Ser. No. 432,576
Claims priority, application Japan, Oct. 9, 1981, 56-161200
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—274 **4 Claims**



1. In a compressor having a double acting piston slidably received in a cylindrical bore formed in a cylinder block, and a cylinder head mounted on an end of the cylinder block with a valve plate held therebetween, the piston defining a variable volume compression chamber in cooperation with the cylinder block and valve plate for compressing fluid therein, the cylinder head defining a low pressure chamber for temporary storage of the fluid to be sucked into the compresson chamber and a high pressure chamber for temporary storage of the fluid discharged from the compression chamber, a capacity modulation device comprising:

an enclosure;

a modulating member received in said enclosure to be movable in response to a pressure differential acting thereon, said modulating member defining a first chamber and a second chamber at opposite sides thereof, said first chamber being communicated to the compression chamber;

back pressure restriction means for restricting back pressures acting on the modulating member so that the effective pressure receiving area of the modulating member becomes smaller at one end than at the other end; and

communication control means for communicating said second chamber in the enclosure selectively to the high pressure chamber and the low pressure chamber;

whereby the modulating member remains in a position to increase the top volume of the compression chamber when the second chamber is communicated to the low pressure chamber by the communication control means and in a position to decrease the top volume when the second chamber is communicated to the high pressure chamber;

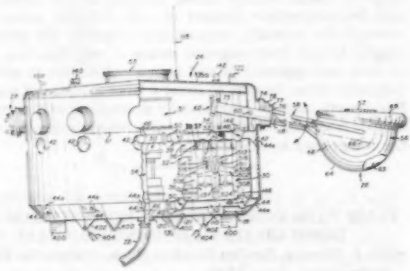
the back pressure restriction means comprising openings formed through opposite ends of the enclosure, the first chamber being communicated to the compression chamber through one of said openings and the second chamber being communicated selectively to the low pressure chamber and high pressure chamber through the other opening and communication control means, respectively.

4,480,966

APPARATUS FOR CONVERTING THE SURFACE MOTION OF A LIQUID BODY INTO USABLE POWER

William W. Smith, Cupertino, Calif., assignor to Octopus Systems, Inc., San Jose, Calif.

Continuation of Ser. No. 287,890, Jul. 29, 1981,. This application Nov. 16, 1983, Ser. No. 552,845
Int. Cl.³ F03B *13/12*
U.S. Cl. 417—332 **22 Claims**



1. A wave motion powered pump apparatus, comprising:

a buoyant main body for disposition on the surface of a liquid having surface wave motion;

liquid inlet means and liquid effluent means;

pump means disposed within said buoyant body and operative to cause liquid to be allowed to flow into said inlet means and to be discharged under pressure through said effluent means;

float means connected to said pump means and operative to actuate said pump means as a function of the differential motion created in said float means and said body by said surface wave motion; and

means for causing said main body and float means to submerge as a single unit below said surface and for raising the submerged unit back to said surface, at will, whereby to serve as a way of protecting said unit underwater during periods of heavy turbulence at the surface thereof, said submerging and raising means including means for controllably decreasing the buoyancy of the combination of said main body and said float means sufficient to cause the entire combination to submerge and for increasing the buoyancy of said combination sufficient to cause the latter to return to said surface, said main body and said float means including internal cavities and said buoyancy decreasing and increasing means including means for allowing water from said body of water to enter at least one of said cavities, means for storing a compressed fluid within at least one of said cavities and means for purging said water-containing cavity of said water using said compressed fluid to do so.

4,480,967

MOTOR-DRIVEN PUMP UNIT FOR A HIGH-PRESSURE CLEANING APPARATUS

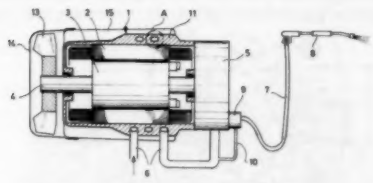
Werner Schulze, Winnenden Hofen, Fed. Rep. of Germany, assignor to Alfred Karcher GmbH & Co., Winnenden, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,231

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115698

Int. Cl.³ F04B *39/06*

U.S. Cl. 417—368 **6 Claims**



1. A motor-driven pump unit for a high-pressure cleaning apparatus, with which cleaning fluid supplied by the pump is conveyed through a casing of the motor in order to cool the motor, characterized in operation by the fact that the flow rate of cleaning fluid from said pump to the cleaning apparatus can be varied from zero flow rate to maximum flow rate while said motor continues to operate said pump and characterized in that a fan wheel driven by said motor is disposed on the side of said motor opposite said pump, said fan wheel directing a cooling air stream over said motor casing, and that said fan wheel and cooling surfaces of said motor are dimensioned such that adequate cooling of said motor is achieved by the fan air cooling alone when the flow rate of cleaning fluid from said pump to the cleaning apparatus is zero.

4,480,968

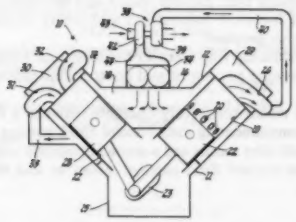
TWO-CYCLE ENGINE COMPRESSOR

John W. Duerr, Plymouth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1984, Ser. No. 597,020

Int. Cl.³ F02B *37/00, 17/00*; F04B *35/00*

U.S. Cl. 417—380 **5 Claims**



1. A positive displacement multiple cylinder engine compressor comprising

a scavenging and charging air pump operative to provide pressurized air,

at least one power cylinder assembly operative on a two-stroke power cycle and having first air admission means connected with the pump to receive pressurized air therefrom for scavenging and charging the power cylinder assembly,

at least one compressor cylinder assembly connected to be driven by the power cylinder assembly on a two-stroke compressor cycle and having second air admission means connected with the pump to receive pressurized air therefrom for charging the compressor cylinder assembly, said second air admission means opening through an end of the compressor cylinder assembly that also communicates with compressed air discharge means,

whereby a common air pump provides pressurized air for scavenging and charging the power cylinder assembly and for delivering a precompressed charge to the compressor cylinder assembly to increase compressor volumetric efficiency.

4,480,969

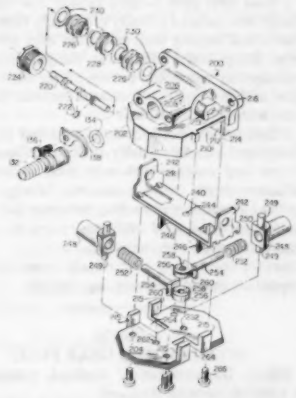
FLUID OPERATED DOUBLE ACTING DIAPHRAGM PUMP HOUSING AND METHOD

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 320,584, Nov. 12, 1981, Pat. No. 4,436,493, which is a continuation-in-part of Ser. No. 77,544, Sep. 21, 1979, abandoned. This application Jul. 25, 1983, Ser. No. 517,181

Int. Cl.³ F04B *43/06*

U.S. Cl. 417—393 **32 Claims**



6. A housing for a fluuid operated double-acting diaphragm pump comprising:

(a) a one-piece molded plastic pump body including

(1) a pair of spaced-apart end sections each of which includes a central circular recess, for use as a driving fluid chamber, a connecting flange surrounding said end section and extending radially outwardly from said recess, and a central shaft opening concentric to said circular recess, said end sections being located in-line on an axis passing through said shaft openings and being arranged in a plane perpendicular to said axis and each of said end sections facing outwardly away from the other end section such that said recesses open outwardly away from said pump body,

(2) a fluid inlet manifold enclosing a fluid inlet passageway and extending between and connecting together said end sections, said inlet manifold being parallel to said axis and being located radially outwardly beyond said recesses, and terminating at each end thereof in a fluid inlet port in each of said connecting flanges and located radially outwardly from said recesses, and said fluid inlet manifold including a single fluid inlet located in-between said ends thereof,

(3) a fluid outlet manifold enclosing a fluid outlet passageway and extending between and connecting together said end sections, said outlet manifold being parallel to said axis and being located radially outwardly beyond said recesses, and terminating at each end thereof in a fluid outlet port in each of said connecting flanges and located radially outwardly from said recesses, and said

fluid outlet manifold including a single fluid outlet located in-between said ends thereof, and

(4) a driving fluid manifold enclosing a driving fluid passageway and extending between and connecting together said end sections, said driving fluid manifold being parallel to said axis and being located radially inwardly of the peripheral edge of said recesses and terminating at each end thereof in a single driving fluid port in a respective one of said end sections and in fluid communication with the recess therein, and

(b) a pair of identical, one-piece, molded plastic end caps connected one each to a respective one of said end sections, each of said end caps including

(1) a central section including a circular recess concentric to said pump body recesses, for use as a discharge chamber,

(2) a connecting flange surrounding said central section and extending radially outwardly from said end cap recess and matingly engaging the adjacent end section connecting flange, said end cap recess facing axially inwardly toward the adjacent end section recess,

(3) a fluid inlet port located in said end cap connecting flange and located radially outwardly from said end cap recess and mating with said fluid inlet port in the adjacent pump body connecting flange, and a fluid inlet passageway extending between said end cap fluid inlet port and said end cap recess to provide fluid communication therebetween, and

(4) a fluid outlet port located in said end cap connecting flange and located radially outwardly from said end cap recess and mating with said fluid outlet port in the adjacent pump body connecting flange, and a fluid outlet passageway extending between said end cap fluid outlet port and said end cap recess to provide fluid communication therebetween,

(c) means for connecting each of said pump body flanges to a respective one of said end cap flanges.

4,480,970

SELF PRIMING GEAR PUMP

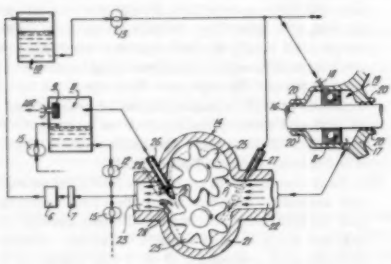
Stanley Smith, Gloucestershire, England, assignor to Rolls-Royce Limited, London, England

Filed May 28, 1982, Ser. No. 383,191

Claims priority, application United Kingdom, May 30, 1981, 8116599

Int. Cl.[3] **F04C** *2/18, 15/00*

U.S. Cl. 418—15 **3 Claims**



1. A gear pump comprising a housing having a first inlet opening communicating with a first liquid source and an outlet opening, two intermeshing gears which, when driven, pump liquid from the first inlet opening to the outlet opening, a vent pipe extending into the housing at the outlet side of the pump to a region spaced from the housing and lying near the point of intersection of the gears out of the path of liquid centrifuged by the gears, and a second inlet opening communicating with a second liquid source angled relative to the first inlet opening so as to direct liquid across the first inlet opening into a gap formed between the periphery of one of the gears and the housing.

4,480,971

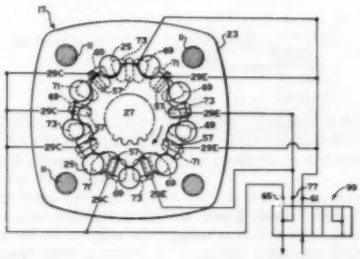
TWO-SPEED GEROTOR MOTOR

N. Einar Swedberg, Chanhassen, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 17, 1983, Ser. No. 458,227

Int. Cl.[3] **F01C** *1/02;* **F03C** *3/00*

U.S. Cl. 418—61 B **6 Claims**



1. In a rotary fluid pressure device of the type including housing means defining fluid inlet means and fluid outlet means, fluid energy-translating displacement means defining expanding and contracting fluid volume chambers, stationary valve means defining stationary fluid passage means in fluid communication with said expanding and contracting volume chambers, a rotary disc valve member defining inlet and outlet valve passage means providing fluid communication between said inlet and outlet means, respectively, and said stationary fluid passage means in response to rotary motion of said disc valve member, and a valve seating mechanism including a generally annular balancing ring member in engagement with a rear face of said disc valve member, and adapted to maintain said disc valve member in sealing engagement with said stationary valve means, characterized by:

(a) said housing means defining control fluid passage means;

(b) said disc valve member defining control valve passage means disposed to provide fluid communication between said control fluid passage means and said stationary fluid passage means in response to said rotary motion of said disc valve member;

(c) said balancing ring member defining axial passage means comprising a portion of said control fluid passage means; and

(d) valve means selectively operable between a first condition communicating said control fluid passage means to said fluid inlet means and a second condition communicating said control fluid passage means to said fluid outlet means.

4,480,972

GEROTOR MOTOR AND CASE DRAIN FLOW ARRANGEMENT THEREFOR

Steven J. Zambusch, Eden Prairie, Minn., assignor to Eaton Corporation, Cleveland, Ohio

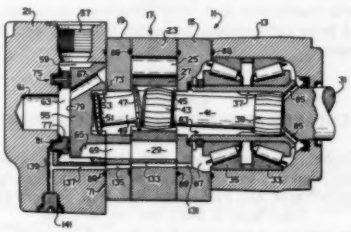
Filed May 31, 1983, Ser. No. 499,664

Int. Cl.[3] **F01C** *1/02;* **F03C** *3/00*

U.S. Cl. 418—61 B **10 Claims**

1. A rotary fluid pressure device of the type including housing means defining fluid inlet means and fluid outlet means; fluid energy-translating displacement means associated with said housing means and defining expanding and contracting fluid volume chambers; stationary valve means defining fluid passage means in fluid communication with said expanding and contracting volume chambers; a rotary valve member defining

valve passage means providing fluid communication between said inlet and outlet means and said fluid passage means, and having a valve surface associated with said stationary valve means; said housing means defining annular chamber means neighboring said rotary valve member; first and second seal means operably associated with said annular chamber means and cooperating with said housing means and said rotary valve member to define a first fluid chamber and a second fluid chamber, said first seal means substantially preventing fluid communication from said first fluid chamber to said annular chamber means, and said second seal means substantially preventing fluid communication from said second fluid chamber to said annular chamber means; said fluid inlet means being in fluid communication with one of said first and second fluid



chambers, and said fluid outlet means being in fluid communication with the other of said first and second fluid chambers; said device including a fluid drain region adapted to receive leakage fluid from said displacement means; characterized by;

(a) said housing means defining fluid drain passage means providing relatively unrestricted communication between said fluid drain region and said annular chamber means; and

(b) said first and second seal means being operable to permit communication of leakage fluid from said annular chamber means to said first and second fluid chambers, respectively, when said first and second fluid chambers, respectively contain fluid at a pressure below the pressure of said fluid drain region.

4,480,973

VANE COMPRESSOR PROVIDED WITH ENDLESS CAMMING SURFACE MINIMIZING TORQUE FLUCTUATIONS

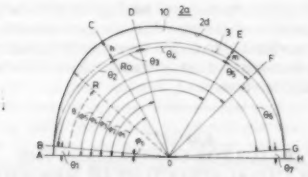
Yutaka Ishizuka, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Jul. 7, 1982, Ser. No. 395,867

Claims priority, application Japan, Jul. 13, 1981, 56-108965

Int. Cl.³ F04C *18/00*

U.S. Cl. 418—150 **10 Claims**



1. In a vane compressor including: a pump housing having inner surfaces thereof formed with an endless camming inner peripheral surface; a cylindrical rotor rotatably received within said pump housing, said rotor having an outer peripheral surface thereof formed therein with a plurality of axial slits; a plurality of vanes radially movably fitted in said slits of said rotor; and a drive shaft coupled to said rotor for rotating said rotor; whereby rotation of said rotor causes said vanes to slidingly move along said endless camming inner peripheral surface of said pump housing in a predetermined circumferential direction to define at least one pumping chamber between the inner surfaces of said pump housing, the outer peripheral surface of said rotor and said vanes, for performing suction, compression and discharge of fluid,

the improvement wherein said endless camming inner peripheral surface of said pump housing has at least one portion for performing one cycle of suction, compression and discharge of fluid in cooperation with said vanes and said rotor, said at least one portion comprising:

an increasing radius portion along which the amount of protrusion of each of said vanes from said rotor gradually increases with the movement of the vane;

a first decreasing radius portion along which the amount of protrusion of said each vane from the rotor gradually decreases with the movement of said each vane; and

a second decreasing radius portion along which the amount of protrusion of said each vane from the rotor gradually decreases with the movement of said each vane;

said increasing radius portion, said first decreasing radius portion and said second decreasing radius portion being successively arranged in the order mentioned in said predetermined moving direction of said vanes, each of said three portions having a starting end and a terminating end and having a cam profile such that each of said vanes has velocity of radial movement thereof varying at a rate gradually decreasing as said each vane approaches the terminating end of said each portion;

at least one of said increasing radius portion, said first decreasing radius portion and said second decreasing radius portion having a cam profile such that the distance between the camming surface of said at least one portion and the center of said rotor varies along a sine curve; and

said increasing radius portion having a cam profile obtained by the following equation:

$$R = Ro + h \sin^2 (90°/\Phi a)\theta a$$

where

R = the distance between the center of the rotor and the camming surface of the increasing radius portion,

Ro = the radius of the rotor,

h = the amount of protrusion of each vane from the rotor at the terminating end of the increasing radius portion,

Φa = the angle through which the increasing radius portion circumferentially extends about the center of the rotor, and

θa = the angle at which tip of each vane moving from the starting end of the increasing radius portion toward the terminating end thereof lies apart from the starting end of the increasing radius portion with respect to the center of the rotor.

4,480,974

CONTINUOUS AND AUTOMATIC APPARATUS FOR MOLDING CHOCOLATE BLOCK HAVING ORNAMENTAL RELIEF PATTERN

Tokuji Akutagawa, Tokyo, Japan, assignor to Akutagawa Confectionery Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,957

Int. Cl.³ A23G *1/20, 1/26*

U.S. Cl. 425—112 **12 Claims**

1. An apparatus for continuously and automatically molding a chocolate block including an ornamental relief pattern made of a first chocolate material of one color and a body portion carrying said ornamental relief pattern and made of a second chocolate material of different color, comprising:

(a) conveyer means for carrying thereon a plurality of first molds successively placed at intervals, each first mold having a top face provided with at least one engraved

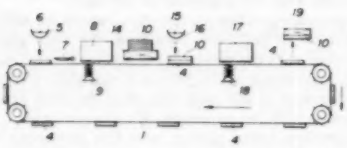
mold cavity, at least the portion of said top face surrounding said engraved mold cavity being flat and smooth;

(b) means for casting a fluidized first chocolate material for forming said ornamental relief pattern into each of the engraved mold cavities of said first molds one by one;

(c) scraping means for scraping the top face of each first mold to press said first chocolate material into said engraved mold cavity and to scrape off the excess first chocolate material;

(d) a first cooler for cooling said first chocolate material contained in said engraved mold cavity of said first mold;

(e) means for placing a second mold in situ on said first mold, said second mold having at least one through-opening



defining a mold cavity and a bottom face with at least the portion thereof surrounding said through-opening forming a generally flat rough surface portion said portion having a surface roughness extending from said bottom face in the range of 50 microns to 2 mm;

(f) means for casting a fluidized second chocolate material into said second mold combined with said first mold through said through-opening;

(g) a second cooler for successively cooling said first and second chocolate materials contained in the combined first and second molds to solidify the same; and

(h) means for removing the solidified first and second chocolate materials from the molds to obtain an integral product chocolate block.

4,480,975

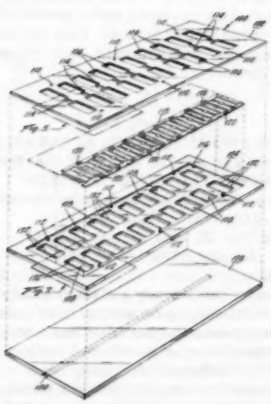
APPARATUS FOR ENCAPSULATING ELECTRONIC COMPONENTS

Lawrence L. Plummer, Collegeville, Pa., and Kenneth Mikle, Marlton, N.J., assignors to Kras Corporation, Fairless Hills, Pa.

Continuation of Ser. No. 279,494, Jul. 1, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 452,669

Int. Cl.³ B29D *3/00*

U.S. Cl. 425—116 **13 Claims**



1. A system for encapsulating electronic components with a protective insulating plastic including a press with upper and lower coactive press assemblies, at least one plastic molding module operatively situate between said assemblies, said module including upper and lower flat carrier plates, each having a partial electronic component and liquid plastic encapsulating material cavity therein, and adapted upon reverse cavity position juxtapositioned to form a total encapsulating cavity, said carrier plates consisting of premolded, cast and shaped plastic material, means for introducing a hardenable liquid plastic material to said total cavity having an electric component therein to surround said component and provide a hardened dimensionally accurate body of plastic around said electronic component, (to thereby constitute) said plates and said encapsulated component constituting a removable unit as a dense, void free package in the absence of damage to a preassembled electronic component and with extraneous hardened plastic material being subsequently separable from said encapsulated component.

4,480,976

ADJUSTABLE SLIDING MOLD FOR CONTINUOUS CASTING INSTALLATIONS

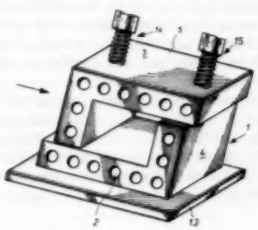
Gert Vaubel, Warburg-Welda, and Heinz Beier, Paderborn-Schloss Neuhaus, both of Fed. Rep. of Germany, assignors to Benteler-Werke AG, Paderborn, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 471,146

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207579; Jun. 18, 1982, 3222836

Int. Cl.³ B22D *11/02, 27/08*

U.S. Cl. 425—186 **9 Claims**



1. An adjustable sliding mold for use in extrusion installations producing continuous castings, comprising two L-shaped mold parts each defining a short arm and a long arm, said mold parts slidably engaging each other at two contact surfaces and forming together an extrusion channel of a substantially rectangular cross section, means for slidable adjusting the mutual position of the two mold parts in a direction transverse to the extrusion channel, at least one of the mold parts being hinged to adjusting means which moves the parts in direction transverse to the extrusion channel, and guiding means for adjusting the angular position of the movable one part relative to the other part proportionally to its transverse displacement so that in increasing the width of the extrusion channel its taper is increased, and vice versa.

4,480,977

APPARATUS FOR CONTROLLING THE CROSS-SECTIONAL STRUCTURE OF MESOPHASE PITCH DERIVED FIBERS

Faramarz Nazem, Strongsville, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

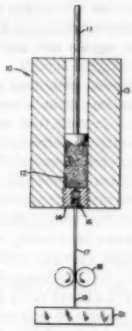
Division of Ser. No. 215,412, Dec. 11, 1980, Pat. No. 4,376,747. This application Mar. 11, 1983, Ser. No. 474,474

Int. Cl.³ B28B *17/00*

U.S. Cl. 425—192 S **5 Claims**

1. A spinnerette for spinning a continous pitch fiber from

mesophase pitch, comprising a reservoir for the mesophase pitch, heating means for heating the mesophase pitch in said reservoir, pressing means for exerting pressure on said mesophase pitch, outlet means comprising a spinnerette channel



through which said mesophase pitch communicates from said reservoir to the outside of said spinnerette to form said pitch fiber, and a porous body positioned near the exit opening of said spinnerette channel.

4,480,978

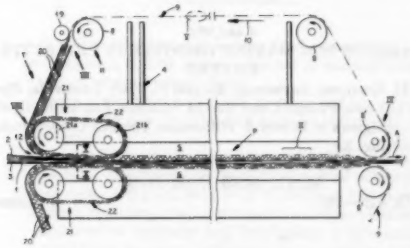
PRESS FOR THE PRODUCTION OF PRESSEDBOARD

Klaus Gerhardt, Rheurdt, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed May 14, 1982, Ser. No. 378,255

Int. Cl.³ A23G *1/20*

U.S. Cl. 425—371 **6 Claims**



1. An apparatus for the pressing of a continuous layer of a comminuted material and binder to be consolidated in the production of pressedboard, comprising:

a pair of endless bands having juxtaposed portions for conveying said layer through a pressing zone, said layer entering said pressing zone between said bands at an upstream end and leaving said pressing zone at a downstream end;

respective support surfaces juxtaposed spacedly with said bands respectively on sides thereof opposite said layer along said pressing zone along said portions;

a pair of endless chains, each formed with a succession of links joined at articulations and provided with roller bars at alternate articulations along the respective chains, said roller bars being receivable between the respective support surface and band for pressing said material through the respective bands; and

means for imparting a zigzag displacement of the links of said chains where said roller bars move through said pressing zone and drawing said links out into an extended pattern outside said roller zone.

4,480,979

STRETCH FORMING HOLLOW ARTICLES

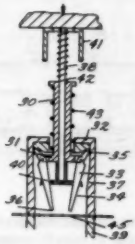
Donald G. Keith, Mount Eliza, and Anthony E. Flecknoe-Brown, Carlton, both of Australia, assignors to A.A.R.C. (Management) Pty. Limited, Victoria, Australia

Continuation-in-part of Ser. No. 40,312, May 18, 1978, Pat. No. 4,288,401. This application Sep. 2, 1981, Ser. No. 298,917

Claims priority, application Australia, May 18, 1978, PD4433; Jun. 22, 1978, PD4833; Apr. 3, 1979, PD8263; Apr. 17, 1979, PD8393; Feb. 23, 1981, PE7705; Feb. 23, 1981; PE7706; Feb. 23, 1981, PE7707; Feb. 23, 1981, PE7708

Int. Cl.³ B29C *17/03*

U.S. Cl. 425—403 **1 Claim**



1. Apparatus for stretch-forming a heat-softened sheet of thermoplastics material, said apparatus comprising holding means to hold the sheet against substantial non-stretching movement, a stretching tool, and means to cause a primary movement of said stretching tool in a preselected direction relative to said holding means so as to cause the tool to press against a sheet held by said holding means and to stretch the sheet; characterized in that said stretching tool comprises a plurality of blades having edges for pressing against a sheet to stretch the sheet preferentially outside an area already in contact with said blade edges and there is a cam operative on the continued movement of said stretching tool in said preselected direction to move said blades transversely of said preselected direction and away from each other to simultaneously further stretch said sheet in said preselected direction and in a direction transverse to said preselected direction, said cam having a cam surface engaging a cam follower surface on each blade and said cam being a barrel cam generally telescoped over the tool and engageable with the holding means to assume an axially fixed position, and said means for causing a primary movement of said tool being operative to effect movement of said blades through said cam.

4,480,980

APPARATUS FOR EXTRUDING COMPOSITE FOOD PRODUCTS

Archie R. McFarland; Jack C. Middleton, and Claudio dos Santos, all of Salt Lake County, Utah, assignors to Beehive Machinery, Inc., Sandy, Utah

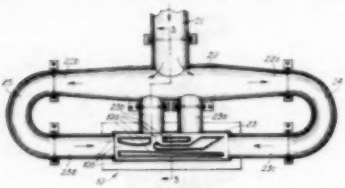
Continuation of Ser. No. 956,973, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 772,733, Feb. 28, 1977, abandoned. This application Sep. 4, 1979, Ser. No. 72,054

Int. Cl.³ A22C *7/00*; B29D *7/02*; B29F *3/04*

U.S. Cl. 425—131.1 **9 Claims**

1. In apparatus for extruding composite food products from different food materials, which apparatus includes a plurality of hoppers for the supply of the respective food materials, a corresponding plurality of food pumps having deaerating means associated therewith, and conduits leading from said hoppers to said food pumps; an extrusion assembly comprising an extrusion die including a housing having a separable front wall and an open rear, and a plurality of individual die conduits adapted to extend within the housing along their lengths from securement to and opening through said front wall, and for providing a plurality of die passages within the housing, inter-

leaved with said die conduits, and open to the interior of the housing; a plenum feed fitting adapted to be separably attached to the die housing at said front wall thereof and having an outlet for comprehending the openings of said plurality of die conduits through said front wall; supply conduits for separably interconnecting said food pumps with said plenum feed fitting and with the interior of said housing at diverse locations, respectively; said supply conduits including an elongate header conduit for extending transversely of said housing and of said die conduits, a pair of removable substantially semi-circular conduit fittings and an associated pair of nipple members for interconnecting respective ends of said header conduit with mutually opposite lateral sides of said housing so as to supply



a food material from one of the hoppers to said die passages within the housing, a pair of nipple members leading into the housing between said lateral sides thereof, and means for removably connecting said header conduit intermediate its length with the last named nipple members to further supply a food material from said one hopper to said die passages within said housing; a convergent discharge conduit adapted to be separably attached to the die housing and having its larger end substantially commensurate with and adapted to be in registry with the open rear of said housing for receiving extruded material therefrom, compressing it into a unitary slab, and for discharging the slab; and securement means for detachably securing supply conduits, plenum feed fitting, separable die components, and discharge conduit together.

4,480,981

SYSTEM FOR CONTROLLING TEMPERATURE OF MOLTEN RESIN IN CYLINDER OF EXTRUDER

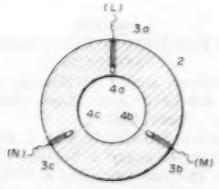
Tsuyoshi Togawa; Teruyuki Nakamoto, both of Tokyo; Mitsuo Iwata, Suzuka; Katuhiko Ito, Suzuka; Hideo Sano, Suzuka; Nobutaka Sekine, Suzuka, and Tomoe Shibuya, Tokyo, all of Japan, assignors to Fujikura Ltd., Japan

Filed Feb. 28, 1983, Ser. No. 470,147

Claims priority, application Japan, Feb. 27, 1982, 57-31575

Int. Cl.³ B29F *3/08*

U.S. Cl. 425—143 **7 Claims**



1. A system for controlling a temperature of a molten resin in a cylinder of an extruder having an extruding screw in said cylinder, said system comprising:

(a) temperature detecting elements received in a wall of said cylinder and disposed generally in a preselected plane perpendicular to a longitudinal axis of said cylinder, said plurality of temperature detecting elements being radially spaced by different distances from an inner peripheral surface of said cylinder wall, and each of said temperature detecting elements being operable to detect the temperature of said cylinder in said preselected plane to thereby produce a temperature detecting signal;

(b) means for detecting an ambient temperature of said extruder to produce a first correction signal;

(c) means for detecting the number of revolutions of said screw to produce a second correction signal;

(d) analogue-to-digital converter means for converting said temperature detecting signals and said first and second correction signals into digital signals;

(e) memory means for storing programs relating to desired temperatures of said molten resin in said cylinder;

(f) a microprocessor unit having first memory means for storing programs relating to corrected temperatures determined by the ambient temperature of said extruder and the number of revolutions of said screw, said microprocessor unit having second memory means for storing programs relating to estimated temperatures of said molten resin, said microprocessor unit being responsive to said digital signals to calculate a proper estimated temperature of said molten resin and to calculate a difference between said desired temperature of said resin and said estimated temperature of said resin and to determine in accordance with said difference a set temperature of one of the portions of said cylinder wall in which said plurality of temperature detecting elements are disposed, and said microprocessor unit sending output information representative of said set temperature;

(g) digital-to-analogue converter means for converting said output information into an analogue signal;

(h) temperature regulating means for comparing said analogue signal and the temperature detecting signal from the temperature detecting element disposed at said portion of said cylinder to produce a temperature control signal; and

(i) temperature control means operable in response to said temperature control signal for bringing the temperature of said portion of said cylinder wall into agreement with said set temperature.

4,480,982

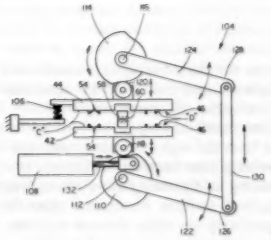
APPARATUS FOR MAKING GROOVES IN CIGARETTE FILTERS

John H. Sexstone, Anchorage; Everett N. Finn, Louisville; Byron L. Lowe, Prospect, and Ken M. Milliner, Louisville, all of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Feb. 7, 1983, Ser. No. 464,277

Int. Cl.³ B28B *11/08, 21/00*

U.S. Cl. 425—385 **8 Claims**



1. An apparatus for making grooves in a filter rod comprising:

die means comprising a lower die block adapted for vertical movement and having groove forming means at its upwardly facing surface, an upper die block adapted for vertical movement and having groove forming means at its downwardly facing surface, the downwardly facing surface of the upper die block being disposed in overlaying facing relationship to the upwardly facing surface of

the lower die block, whereby the groove forming means of the lower die block and upper die block are adapted to be embedded into a filter rod disposed between the lower and upper die blocks to impress grooves in the filter rod when the lower and upper die blocks are vertically moved toward each other;

means for moving the lower and upper die blocks vertically toward each other in unison, and away from each other in unison; and,

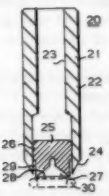
stripper means for holding the filter rod to be grooved in a stationary position between the lower and upper die blocks as the lower and upper die blocks move toward each other, and for holding the grooved filter rod stationary between the lower and upper die blocks as the lower and upper die blocks move away from each other to allow the groove forming means of the lower and upper die blocks to be extracted from the filter rod.

4,480,983

COLLET AND METHOD FOR DISPENSING VISCOUS MATERIALS

Victor J. Adams, Tempe, and Frank Polka, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 13, 1982, Ser. No. 378,026
Int. Cl.³ B29C *23/00*; B29F *3/04*
U.S. Cl. 425—467 **5 Claims**



1. A collet for dispensing viscous fluid comprising:

an elongated, hollow member having an internal cross-section of predetermined shape;

an insert press-fitted within said member and having a blind, conical aperture on an end adjacent an end of said hollow member;

said insert being supported within said hollow member by a plurality of substantially parallel elongated ridges extending along and projecting from the sides of said insert, said ridges extending toward the end of said insert remote from said conical aperture and terminating a substantial distance from the end of said insert having said conical aperture.

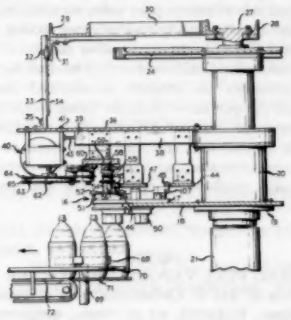
4,480,984

APPARATUS FOR HEAT-SHRINKING THERMOPLASTIC SLEEVES ABOUT GLASS CONTAINERS

Frank J. DiFrank, Toledo, and Fred L. Wallington, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 9, 1983, Ser. No. 530,456
Int. Cl.³ B29C *17/00, 27/00*
U.S. Cl. 425—508 **19 Claims**

1. Apparatus for handling containers through a circular path of travel where the containers are held by their necks while a sleeve of heat-shrinkable plastic is telescoped thereon and then heated to shrink the sleeve into bottle-conforming relationship, the improvement in the container neck-grasping mechanism comprising a generally circular, horizontal platform, means for rotating said platform about a central vertical axis, a plurality of circumferentially spaced, neck-grasping chucks, means connected to said chucks for mounting said chucks on said platform, said chuck mounting means comprising a radially-extending plate, a chuck holder extending through an opening in said plate, means rotatably supporting said holder in said plate, spring-biased, actuated detent means on said plate, a first stationary cam means positioned to be engaged by said cam follower means to bias said detent against said holder, a notch in said holder for engagement with said detent in a specific



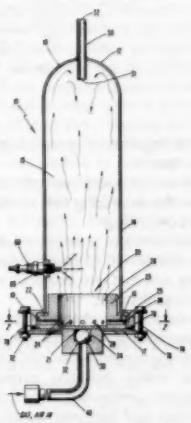
rotational orientation of said holder through a portion of the rotation of said platform, second stationary cam means for opening the chucks to release a sleeved container and later close about a bare container, and means for rotating said chucks at selected circumferential positions of said chuck holders during their movement with said plates.

4,480,985

PULSING COMBUSTION

Robert E. Davis, Mountain Home, Ark., assignor to Arkansas Patents, Inc., Mountain Home, Ark.

Division of Ser. No. 218,849, Dec. 22, 1980,. This application Feb. 25, 1982, Ser. No. 352,331
Int. Cl.³ F23C *11/04*
U.S. Cl. 431—1 **14 Claims**



1. A pulsing combustion device comprising:

means for defining an elongate combustion chamber having an inlet for a combustible mixture and an unvalved outlet for combustion gases;

a floating poppet valve member mounted in reciprocation relation in a wall of said combustion chamber, said poppet valve member having a first side in communication with said combustion chamber and a second side in communication with a supply of a combustible mixture and having

at least one port through the periphery of said valve member, said reciprocation of said poppet valve member in said wall closing and opening communication through said at least one port between said combustion chamber and said supply of combustible mixture;

means for supplying a pressurized combustible mixture to said second side of said poppet valve member, said supply means having substantially smaller cross section area than said second side of said poppet valve member;

means for combusting said combustible mixture in said combustion chamber to produce pressurized combustion gases, said poppet valve member being reciprocated by said pressurized combustible mixture in communication with said second side and said pressurized combustion gases in communication with said first side to regulate the flow of said combustible mixture into said combustion chamber.

4,480,986

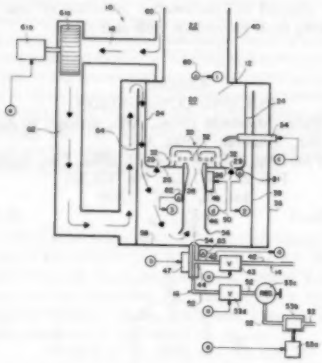
LIQUID FUEL VAPORIZING BURNER

Richard H. Nelson; Ray G. Christensen, both of Bellevue, and David Stedman, Redmond, all of Wash., assignors to Sen-Labs, Inc., Bellevue, Wash.

Filed Sep. 14, 1983, Ser. No. 532,270

Int. Cl.³ F23N *1/00*

U.S. Cl. 431—37 **20 Claims**



1. A fuel vaporizing burner comprising:

a combustion chamber;

fuel inlet means communicatively connected to said combustion chamber for delivering fuel to said chamber, said fuel inlet means comprising:

a conduit connected to a supply of said fuel;

an atomizer connected to said conduit, said atomizer for converting said fuel into droplets, said atomizer including a heating element;

means forming a mixing chamber opening to said atomizer and communicating with said combustion chamber; and

valving means arranged about said conduit;

said atomizing means including primary air inlet means communicatively connected to said mixing chamber and interactive with said fuel inlet means;

secondary air inlet means extending about said combustion chamber in heat exchange relationship means in communication with said secondary air inlet means for passing air to said combustion chamber and said mixing chamber; and

control means interactive with said primary air inlet means and said secondary air inlet means for independently varying the flow rates of said air passing therethrough responsive to temperature conditions within said burner, said heating element and said valving means being responsive to signals from said control means.

4,480,987

COMBUSTION APPARATUS FOR LIQUID FUELS

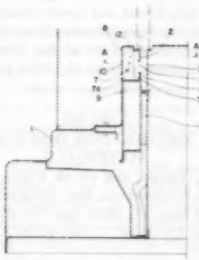
Tomomasa Mandai, Nara; Hiromi Ohta, Ikoma; Tadashi Yamazaki, Nara, and Yoshihisa Urakawa, Yamato-kohriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 26, 1983, Ser. No. 461,237

Claims priority, application Japan, Feb. 1, 1982, 57-15101; Feb. 10, 1982, 57-20002; Feb. 17, 1982, 57-24742

Int. Cl.³ F23D *3/18*

U.S. Cl. 431—304 **5 Claims**



1. A combustion apparatus for liquid fuels comprising;

inner and outer cylindrical wall means extending substantially vertically and opposed to each other with a gap therebetween,

wick means movable up and down as guided between and along said wall means,

a burning zone formed above said wall means,

fuel passage opening means provided in said outer wall means and adapted to be opened and closed by the descent and ascent, respectively, of said wick means,

fuel trap chamber means provided on one side of said opening means remote from said wick means, and

a cylindrical porous member extending substantially vertically within said chamber means.

4,480,988

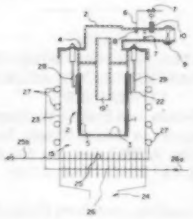
SURFACE COMBUSTION TYPE BURNER WITH AIR SUPPLY ENTIRELY AS PRIMARY AIR

Makoto Okabayashi, Nabari; Yasuo Takeishi, Osaka; Yoichi Higuchi, Katano, and Kazuto Taguchi, Sakai, all of Japan, assignors to Osaka Gas Company, Limited, Osaka, Japan

Filed May 17, 1982, Ser. No. 378,977

Int. Cl.³ F23D *13/14*

U.S. Cl. 431—329 **2 Claims**



1. A surface combustion type burner with a single-stage air supply of primary air and a fuel supply, comprising a tubular body portion, an elongated, perforated, metal base extending from and secured to said body portion to receive a mixture of primary air and fuel therein, said perforated metal base having a 5–15 percent perforation ratio, a 25–35 mesh metallic netting overlying said perforated metal base in close contact there-

with, said metallic netting having a greater perforation ratio than said metal base, and a flame-sustainer metallic netting wrapped around an end portion of said metallic netting juxtaposed said body portion and around an end portion of said body portion adjacent said metallic netting to avoid flame lift, a combustion surface being defined by that portion of said metallic netting exposed from said flame-sustainer metallic netting.

4,480,989

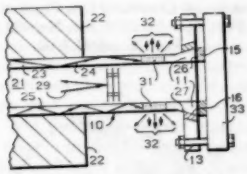
METHOD OF COOLING A FLANGE AND COUPLING

Robert D. Darnell, Phoenix; Carl A. Goetz, Scottsdale, and William M. Ingle, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 250,494, Apr. 2, 1981, Pat. No. 4,411,619. This application Sep. 29, 1983, Ser. No. 518,186

Int. Cl.³ F27B *14/10;* **F27D** *7/00;* **H01L** *7/00*

U.S. Cl. 432—1 **6 Claims**



3. A method for protecting a closure means for a thermal radiation carrying member composed of a predetermined material, from radiation being carried by said member within said material from a portion of said member exposed to a thermal radiation source, comprising:

installing serially in said material of said member a thermal radiation scattering zone between said source and said closure means so as to reduce the thermal radiation reaching said closure means.

4,480,990

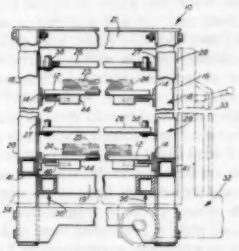
ARTICLE SUPPORT RACK AND METHODS OF WEIGHTING DOWN ARTICLES

William D. Beam, Richmond; David C. Chrisman, Sandston; Lloyd R. Cox, Richmond, and Charles R. Hankins, Sandston, all of Va., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,158

Int. Cl.³ F27D *3/00, 5/00;* **F26B** *9/04;* **B02C** *11/08*

U.S. Cl. 432—9 **16 Claims**



1. An article support rack, which comprises:

first and second support frames mounted to translate vertically with respect to each other;

at least one article support mounted to the first frame, said article support having an upper support surface adapted to receive at least one article and to support the shape of said at least one article loaded thereon; and

at least one weight supported by said second frame in a spaced position above and adjacent to said at least one article support and said at least one article upon having been loaded onto said article support, said first frame guided for movement with respect to said second frame to raise said at least one article support and said at least one article loaded thereon toward and into forced contact with said at least one weight, such that said at least one weight is raised from said second frame to rest on said at least one article upon such movement of said first frame to raise said at least one article support.

4,480,991

PROCESS OF AND APPARATUS FOR OPERATING A SHAFT FURNACE

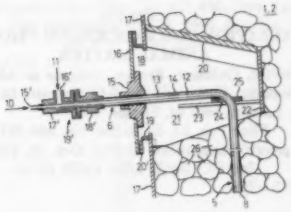
Erwin Füssl, Zürich, Switzerland, assignor to Maerz Ofenbau AG, Zürich, Switzerland

Filed Dec. 17, 1982, Ser. No. 450,746

Claims priority, application Switzerland, Dec. 23, 1981, 8267/81

Int. Cl.³ F27B *15/00;* **F23Q** *9/00;* **F27D** *7/00;* **F27B** *3/20*

U.S. Cl. 432—14 **10 Claims**



1. A process of operating shaft furnaces for burning limestone and similar raw mineral materials with the shaft in the furnace having a preheating zone followed by a burning zone, using gaseous, liquid or solid fuels as the fuel in the burning zone, conducting the fuel in a closed passageway through the preheating zone and introducing the fuel into the burning zone at the transition from the preheating zone to the burning zone, introducing fuel into the burning zone in at least two separate locations, supplying at least two separate fuels to each of the separate locations, introducing the separate fuels into the burning zone from separate outlets in a common plane at each location, forming double passageways each for the flow of a separate one of the fuels through the preheating zone into the burning zone, and arranging the double passageways one within the other for providing a central passageway and an annular passageway laterally encircling the central passageway.

4,480,992

METHOD OF HEATING A FURNACE

Kenji Okamoto, Hiroshima, Japan, assignor to Sanken Sangyo Kabushiki Kaisha, Hiroshima, Japan

Filed Sep. 29, 1982, Ser. No. 426,374

Claims priority, application Japan, Oct. 17, 1981, 56-165959; Jul. 17, 1982, 57-124818

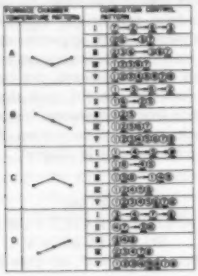
Int. Cl.³ F26B *9/12;* **F27D** *7/00, 19/00;* **F27B** *9/40*

U.S. Cl. 432—18 **14 Claims**

9. A method of uniformly heating a furnace chamber of a heat-treatment furnace, said furnace having a pair of opposite sidewalls between which a workpiece to be thermally treated is positioned, and a plurality of spaced-apart burners supported on opposite sidewalls and directed into the furnace chamber, comprising the step of:

actuating said burners in different sequential combinations of

one or more burners in successive stages according to a predetermined combustion pattern such that the number of said burners actuated during each unit time interval of each stage increases for each successive stage, thereby



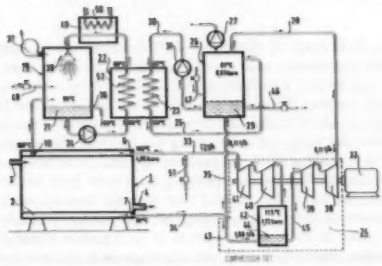
incrementally increasing the rate of combustion in said furnace chamber during said successive stages, and at least one burner is actuated by being alternately turned on and off during each one of said unit time intervals of each of said successive stages.

4,480,993

INSTALLATION FOR PROCESSING CHUNKS OF ANIMAL MATTER

Gérard Guiriec, Quimper, France, assignor to Alsthom-Atlantique Semada, Paris and Societe Industrielle Lorientaise (S.I.L.), Lorient, both of, France

Filed Feb. 23, 1983, Ser. No. 469,052
Claims priority, application France, Oct. 26, 1982, 82 17872
Int. Cl.³ B01D *1/00*; F27B *19/00*
U.S. Cl. 432—266 **3 Claims**



1. An installation for processing chunks of animal matter, said installation comprising:

a double wall cooker defining an oven surrounded by a steam heating chamber, said oven having an inlet for receiving said chunks of animal matter, an outlet for treated matter and an outlet for greasy steam given off by the matter during processing, said steam heating chamber having an inlet for receiving heating steam and an outlet for removing condensed heating steam; and

a condenser connected to said oven greasy steam outlet to receive the greasy steam given off from the processed matter and within which condenser said greasy steam condenses to form a condensate, said condenser having an overflow outlet for the condensate from said greasy steam, the improvement comprising:

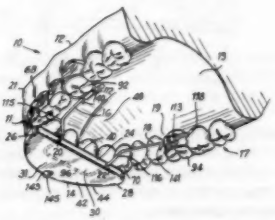
means for circulating and cooling a portion of said condenser's own condensate for use as a cooling fluid, said means for circulating and cooling said condenser condensate comprising a heat exchanger having a primary coil and a secondary coil, a flash bottle having clean water both in the liquid phase and in the vapour phase and being connected to the heat exchanger secondary soil, means for passing said portion of said greasy steam condensate through said primary coil of said heat exchanger, means for pumping said clean water from said flash bottle through said secondary coil of said heat exchanger to cool said portion of said greasy steam condensate such that the cooled condensate is recycled as a cooling fluid for the condenser and said clean water from the liquid phase of the flash bottle is circulated through said secondary coil and returned to the flash bottle, a compressor set having an inlet and an outlet, and means for connecting said flash bottle, at said vapour phase, to the inlet of said compressor set to take low pressure steam constituting the vapour phase of the flash bottle and compressing it to produce said heating steam, and means for connecting the outlet of said compressor set to the inlet of said heating chamber of said cooker, and means for recycling condensed heating steam from the steam heating chamber outlet of said to the flash bottle at said liquid phase.

4,480,994

ORTHODONTIC OCCLUSION PREVENTION SYSTEM

Carl S. Hoffman, 390 Crestwood Dr., Cheshire, Conn. 06410

Filed Apr. 29, 1983, Ser. No. 489,871
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—6 **9 Claims**



1. An orthodontic device, comprising in combination:

plate means mounted over selected upper anterior teeth for preventing contact between said upper anterior teeth and the opposed lower anterior teeth, and

wire means connected to said plate means and to selected upper posterior teeth for anchoring said plate means to said upper posterior teeth, said selected upper anterior teeth including lateral and central incisors, said selected upper posterior teeth including the first molars, said plate means including substantially parallel top and bottom walls intersected by a vertical rear wall that extends substantially at right angles to the mesial of the mouth and a generally C-shaped front wall configured in accordance with said upper anterior incisors, said wire means including a pair of strands each having one end connected to said plate at said rear wall and the other end being folded back into a double strand position including a folded distal end and a strand end positioned between said folded end and said plate, said orthodontic device further including jackets mounted around each of said upper first molars and sheaths connected to the inner walls of said jackets, each said double strand portion being slidably mounted to said sheaths, said sheaths being disposed between said folded distal ends and said strand ends, said folded distal ends being bent inwardly and said strand ends are bent upwardly, whereby said folded distal ends and said strand ends form stops adapted to prevent said double strand portions from sliding in said sheaths, whereby said plate is prevented from sliding, said folded distal portions extending approximately 5 to 7 millimeters past said sheaths and said strand ends extending approximately 2 to 3 millimeters upward, said pair of strands having down bends between said rear wall of said plate to the level of said sheaths, said down bends being closely spread to said rear wall, said pair of strands extending outwardly from said plate spaced from the inner wall of the upper cuspid teeth to said sheaths, said

pair of strands being disposed within and bonded to said plate and further being joined in said plate to form a single strand.

4,480,995

APPARATUS FOR USE IN FABRICATING ORTHODONTIC APPLIANCES

Ronald L. Tate, 3230 Centennial, Sylvania, Ohio 43560

Filed Sep. 22, 1983, Ser. No. 534,967

Int. Cl.³ A61C *11/00*

U.S. Cl. 433—54 **5 Claims**

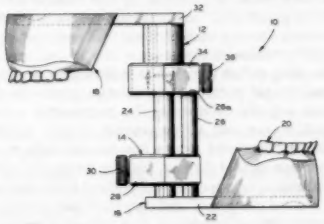
1. An apparatus for use in fabricating orthodontic appliances comprising:

a pair of spaced apart lower and upper horizontally extending arms, said lower arm adapted to carry a lower dental casting and said upper arm adapted to carry an upper dental casting in facing relationship with the lower dental casting;

a guide member attached to said lower arm and extending upwardly in a generally vertical direction;

means for mounting said upper arm on said guide member for vertical movement toward and away from said lower arm, said mounting means including means for preventing any rotative movement of said upper arm relative to said lower arm about said guide member when said upper arm is spaced less than a predetermined distance from said lower arm, and permitting pivotal movement of said upper arm relative to said lower arm about said guide member when said upper arm is spaced more than the predetermined distance from said lower arm; and

reference stop means slidably mounted on said guide member between said lower arm and said upper arm and including means for releasably securing said stop means on said guide member in a selected vertical position relative to said lower arm, said stop means engageable with said mounting means for limiting the spacing between said upper arm and said lower arm.



4,480,996

ENDODONTIC INSTRUMENT FOR DENTAL ROOT CANAL FILLING

Richard C. Crovatto, 207 Foxridge Rd., Orange Park, Fla. 32073

Filed Jan. 4, 1983, Ser. No. 455,937

Int. Cl.³ A61C *3/08*

U.S. Cl. 433—164 **18 Claims**

1. An endodontic instrument for emplacing, heating and condensing a sealing plug in a dental root canal comprising:

an elongated shank having first and second ends said first end of said shank being dimensioned to be insertable within the dental root canal and adapted for having a heat softenable and deformable root canal sealing plug detachably affixed thereto;

elongated retractable conductive means extending longitudinally in said shank, said conductive means being movable in said shank for causing one end thereof to project through said first end, said projecting end adapted for insertion into said plug in direct contact therewith for detachably affixing said plug to said shank and for causing heating of said plug to soften said plug, said conductive means being movable in said shank for withdrawing said one end thereof from said plug and into said shank for releasing said plug from said shank and providing a free end of said shank for condensing said heat softened plug within the dental root canal.

4,480,997

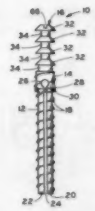
DENTAL POST AND WRENCH THEREFOR AND METHOD OF RESTORING BULK TO A TOOTH ROOT THEREWITH

Allan S. Deutsch, 345 E. 80th St., New York, N.Y. 10021, and Barry L. Musikant, 211 W. 56th St., New York, N.Y. 10019

Continuation-in-part of Ser. No. 321,440, Nov. 16, 1981, abandoned. This application Jan. 4, 1984, Ser. No. 568,082

Int. Cl.³ A61C *5/08*

U.S. Cl. 433—221 **15 Claims**



1. A dental post for thread cutting insertion into a tooth root comprising

a stem having a space defined therein dividing a lengthwise portion of said stem into a plurality of relatively spaced legs,

self-tapping threads on said legs and stem to cut and form a thread in the tooth root as said stem is threadedly inserted thereinto,

said legs being movable relative to each other at said space during the thread cutting insertion of said stem into the tooth root to absorb the application of at least lateral fracturing forces to the walls of the tooth root,

and said space including vent means extending from the insertion end of said stem to at least beyond the tooth root to vent the insertion end of said stem to the atmosphere to vent the build-up of tooth fracturing forces from between said stem and tooth root during the threading of said stem into the tooth root.

4,480,998

DENTAL PINNING DEVICE

Murray D. Carse, 6 Queensway Ct., Hatfield, Hertfordshire AL10 ONR, England

Filed Sep. 17, 1982, Ser. No. 419,298

Claims priority, application United Kingdom, Sep. 24, 1981, 8128961

Int. Cl.³ A61C *5/04*

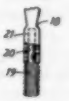
U.S. Cl. 433—225 **5 Claims**

5. A dental pinning device comprising:

a metal endpiece including a threaded pin for screwing from one end thereof into a tooth and and an integral shaft of

diameter smaller than said threaded pin and projecting from the other end of the threaded pin; and

a synthetic resin body including a shank, a formation at one end of said shank for engagement with a latching type dental handpiece, a shearing neck at the other end of the shank, and an end portion connected to said other end of said shank by said shearing neck, said end portion of said synthetic resin body being moulded around and thereby



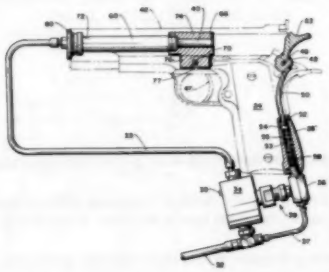
fixed to said shaft of said metal endpiece, such that said metal endpiece is attached to said synthetic resin body, said metal threaded pin extending from said synthetic resin body for screwing into a tooth by rotational driving through said synthetic resin body, said synthetic resin shearing neck being breakable by excessive rotational driving torque to leave said synthetic resin end portion exposed on said tooth and fixed thereon by said metal threaded pin screwed into said tooth.

4,480,999

FIREARM RECOIL SIMULATOR

James L. Witherell, Oxnard, and Michael D. Tibbet, Port Hueneme, both of Calif., assignors to Advanced .45 Technology, Oxnard, Calif.

Filed Nov. 7, 1983, Ser. No. 549,176
Int. Cl.³ F41F *27/00*
U.S. Cl. 434—18 **19 Claims**



1. A firearm having a recoil simulator comprising:

a firearm assembly including a frame having a trigger mechanism that includes a trigger extending from said frame linked to a hammer pivotally mounted on said frame;

actuating means connected to said frame and activated by the trigger mechanism; and,

drive means mounted on said frame and operatively connected to said actuating means whereby activation of said trigger mechanism will actuate the drive means and cause it to create a recoil motion to the firearm, said drive means including a drive member that causes the hammer to move from a first position to a second position.

4,481,000

TOLERANCING DEVICE FOR A WEAPONS FIRE SIMULATOR

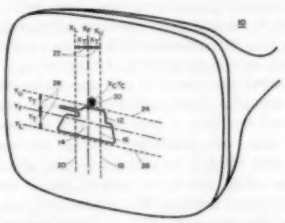
Windell N. Mohon, Athens, Ala., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1982, Ser. No. 373,305
Int. Cl.³ F41G *3/26*
U.S. Cl. 434—20 **5 Claims**

1. A tolerancing device that provides a scoring record in a weapons fire simulator, wherein said simulator has a visual display of an apparent target and electronic means correlated to said target for providing analog signals as an output that define the location of said target in said display, and means correlated to a trainee's operation of said simulation for providing analog signals as an output that define the point in said display that corresponds to the aim point of said simulated weapons fire, comprising:

resettable means coupled to said operation correlated means for counting and indicating the number of pulses in said signal output, wherein said number of pulses are indicative of the number of times said simulated weapon is fired;

analog means coupled to said target correlated means and to said operation correlated means for comparing the values of said signals and determining whether the signal provided by said operation correlated means is within a preselected range of the signal provided by said target correlated means, and for counting and indicating the number of pulses in said signal output from said operation correlated means that are within said preselected range, such



that the number of attempts by said trainee are indicated, and the number of "hits" on said target are indicated, to provide a scoring record of said trainee, including;

a preselectable-voltage source,

processing means coupled to said target correlated means and to said preselectable-voltage source for taking the sum and the difference of a preselected voltage from said source and a first portion of said output of said target correlated means that corresponds to a first dimension in said display, and for taking the sum and the difference of a preselected voltage from said source and a second portion of said output of said target correlated means that corresponds to a second dimension in said display orthogonal to said first dimension, and

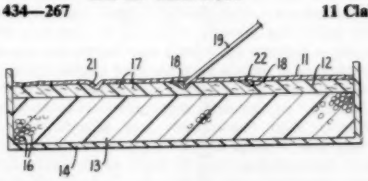
comparator means downstream said processing means and coupled to said operation correlated means for separately comparing said output of said operation correlated means with said sum and said difference in each said dimension, wherein the results from said comparisons determine whether said output of said operation correlated means is within said preselected range.

4,481,001

HUMAN SKIN MODEL FOR INTRADERMAL INJECTION DEMONSTRATION OR TRAINING

Thomas E. Graham, Santa Clara, and Eric E. Sabelman, Menlo Park, both of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Filed May 26, 1983, Ser. No. 498,292
Int. Cl.³ G09B *23/30*
U.S. Cl. 434—267 **11 Claims**



1. A human skin model for demonstrating or pracving a substantially nonporous structure and made of a silicone gel

containing a fibrous reinforcing material; and

(c) an epidermis-simulating layer about 0.1 to 1 mm thick made of a high tear strength, high tensile strength elastomer, the nature of the interface between the epidermis-simulating layer and the dermis-simulating layer being such as to permit fluid injected into the interface to flow at the interface and distend the epidermis-simulating layer.

4,481,002

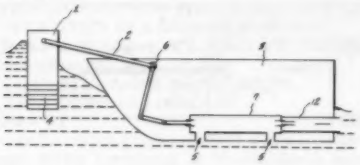
BOAT POWERED BY SEA WAVES

Gary Gargos, 355 W. Windsor Rd., Glendale, Calif. 91204

Filed Dec. 14, 1982, Ser. No. 434,343

Int. Cl.³ B63H *19/02*

U.S. Cl. 440—9 **1 Claim**



1. A boat comprising

a hull;

a float external to said hull, substantially smaller than said hull and pivotally linked to said hull such that said float may ride on the surface of the water substantially independently of said hull;

a propulsion system in said hull including a pump having an inlet to the water and an outlet aft relative to said hull, said propulsion system including two cylinders, pistons in said cylinders, an outlet passage directed aft between said cylinders and in communication therewith and multiple inlets from the water through said hull to said cylinders, positioned outwardly of said cylinders, and check valves between said inlets and said cylinders and between said cylinders and said outlet passage, said pistons being double acting; and

linkage means for coupling said float to said pump and constructed and arranged to transmit relative motion between said float and said hull to said pump.

4,481,003

METHOD OF PRODUCING ITEGRAL ELECTRODE STRUCTURE FOR ELECTRON GUN

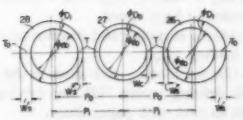
Minoru Yabe; Kenichi Noda; Satoru Endo, all of Mobara, and Masaaki Yamauchi, Tohgane, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 214,693, Dec. 9, 1980,. This application Sep. 29, 1982, Ser. No. 427,583

Claims priority, application Japan, Jan. 18, 1980, 55-3471

Int. Cl.³ H01J *9/14*

U.S. Cl. 445—49 **8 Claims**



1. A method for producing an electrode for use in an electron gun in a color picture tube, comprising the steps of

preparing a box-shaped metallic body having a bottom portion and a side wall,

squeezing said bottom portion to extend a portion of said bottom portion into a space inside said box-shaped metallic body to form three cylindrical members adjacent to one another each provided with an opening at the root of each cylindrical member, and

press working the periphery of each said opening to form a tapering surface of circular cross section which is concentric with said opening at said periphery while providing non-concentric deformations around the bottom portion of at least two of said cylindrical members.

4,481,004

CONTINUOUSLY VARIABLE TRANSMISSION MECHANISM

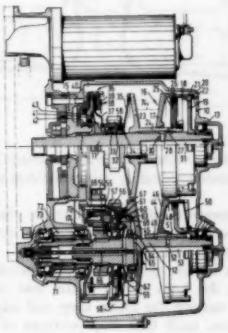
Randle L. Abbott, Tamworth, England, assignor to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft, Bad Homburg, Fed. Rep. of Germany

Continuation of Ser. No. 9,324, Feb. 5, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 142,389

Claims priority, application United Kingdom, Feb. 7, 1978, 4776/78

Int. Cl.³ F16H *55/52*

U.S. Cl. 474—28 **3 Claims**



1. In a continuously variable transmission mechanism incorporating a variator having:

a first sheave of adjustable effective diameter on a first axis,

a second sheave of adjustable effective diameter on a second axis,

a flexible drive band frictionally engaging and interconnecting the two sheaves,

each sheave comprising an axially fixed pulley half and an axially moveable pulley half,

inclined mutually facing surfaces of the pulley halves of each sheave defining a V-groove for the sheave, and

the moveable pulley half of each sheave facing the fixed pulley half of the other sheave in order to maintain alignment of the band with the sheaves over a range of adjustment of the distance between the pulley halves of each sheave,

the improvement comprising:

a first sheave adjustment means including a fluid pressure operated piston and cylinder combination positioned to the side of the fixed pulley half of the first sheave for urging the moveable pulley half towards the fixed pulley half to adjust the width of the V-groove and thus the effective diameter of the first sheave for engagement with the band,

the adjustment means for the first sheave being connected to the moveable pulley half thereof by slidable means extending through a hole in the center of the fixed pulley half,

and the fixed pulley half being mounted to extend radially outward from the center of the hole; and

a second sheave adjustment means including a fluid pressure operated piston and cylinder combination positioned to the side of the moveable pulley half of the second sheave for urging the moveable pulley half towards the fixed pulley half to adjust the width of the V-groove and thus the effective diameter of the second sheave for engagement with the band,

whereby each of the piston and cylinder combinations lie on the same side of the band.

4,481,005

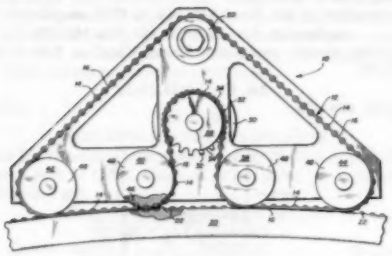
CHAIN DRIVE SYSTEM

James A. Mann, Jr., Richardson, Tex., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 16, 1982, Ser. No. 418,626

Int. Cl.³ F16H 7/06

U.S. Cl. 474—139 **5 Claims**



1. A chain drive system wherein the chain includes a plurality of links interconnected by cables to form a continuous loop comprising:

drive gear means positioned within the chain loop for driving the chain, the chain being disposed around a portion of said drive gear means;

rack means having a plurality of spaced apart teeth for receiving the links of the chain, said rack means being disposed outside the chain loop and adjacent said drive gear means, such that two portions of the plurality of chain links are positioned between said plurality of teeth of said rack means and on either side of the drive gear means;

idler gear mean disposed substantially symmetrically relative to the drive gear means for restraining the portions of the chain within said rack means, the idler gear means having cog recesses therein to receive the links of the chain; and

said drive gear means imparting motion to the chain for causing relative motion between said drive gear means and said rack means, such that the chain is tensioned over said portion of said drive gear means and between said idler gear means and said rack means such that the length of the chain which is unsupported between the drive gear means and the nearest idler gear means to either side is less than one half the sum of the circumferences of the drive gear means and the nearest idler gear means to thereby minimize unrestrained chain and minimize chain stretch.

4,481,006

BAG MAKING METHOD AND MACHINE

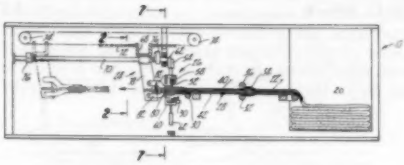
Arthur E. LaFleur, and Lee LaFleur, both of Manistee, Mich., assignors to Custom Packaging Systems, Inc., Manistee, Mich.

Filed Dec. 16, 1981, Ser. No. 331,135

Int. Cl.³ B31B 23/14

U.S. Cl. 493—194 **30 Claims**

1. The method of making bags from flat tubular woven plastic web stock adapted to be fused by heating and which is advanced longitudinally in one direction on a support, said method including the step of severing the stock transversely by means of a heated element extending transversely of the stock at a fixed location on the support, said heated element being reciprocable in a direction perpendicular to the plane of the stock to sever the trailing end of one bag from the leading end of the next successive bag as the stock is intermittently advanced, said severing step comprising arranging a separator plate having a width corresponding to the width of the flat tubular stock on said support so that the leading end of the plate is at all times located directly adjacent and generally parallel to the line of severing produced by the heated element,



telescoping the leading end of the tubular stock over the trailing end of the plate so that the two plies of the tubular stock are spaced apart a distance corresponding to at least the thickness of the plate, intermittently advancing the stock in a downstream direction to a position wherein the desired line of severing between the two bags is aligned directly adjacent the leading end of the separator plate and then reciprocating the heated element past the separator plate and through the two plies to sever the spaced apart plies of the stock directly adjacent the leading end of the separator plate and thereby retain the plies at the leading end of said next bag in said separated condition.

4,481,007

FOLDING MACHINE

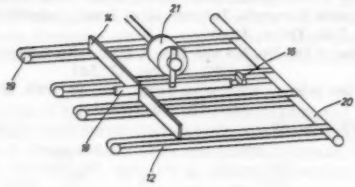
Adolf Hornung, Reichenberg, Fed. Rep. of Germany, assignor to Maschinenbau Oppenweiler Binder GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 274,255, Jun. 16, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 581,206

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022607

Int. Cl.³ B65H 45/18

U.S. Cl. 493—444 **1 Claim**



1. A high-speed paper folding machine comprising

a folding station,

conveyor means (**12**, **20**, **19**) for conveying a series of paper sheets having a leading edge and a trailing edge to the folding station at high speed,

stop means (**14**) for stopping and transversely aligning transversely a leading edge,

knife means (**18**) for folding each sheet in the folding station,

folding knife driving means (**21**) for driving folding knife means (**18**) to fold each paper sheet,

detector means (**16**) positioned upstream of stop means (**14**) by at least the length of the longest sheet of paper to be handled for detecting the leading edge of each sheet,

timing means (22,24) connected to the detecting means (16) for actuating the knife driving means (21) to drive the folding knife means (18) to fold each paper sheet,

said detector means (16) including detector means (16) for sensing the trailing edge of the sheet and means (30, 36, 38) for preventing actuation of the knife means (18) until the trailing edge has passed the detector means (16),

said detector means (16) including means for sensing the trailing edge of the sheet and means (30, 36, 38) for stopping the conveyor means (12, 20, 19) and the feeding of sheets to the folding station until the trailing edge has passed the detector means (16).

4,481,008

APPARATUS AND METHOD FOR RELIEVING EXCESS NEGATIVITY IN A DRAINAGE DEVICE

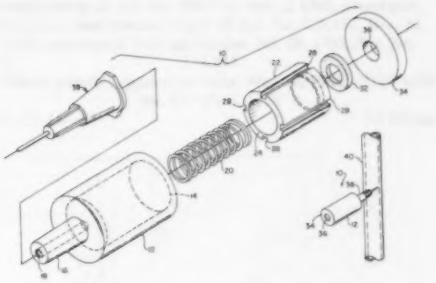
Leonard D. Kurtz, Woodmere, N.Y., assignor to BioResearch Inc., Farmingdale, N.Y.

Filed Oct. 8, 1981, Ser. No. 309,796

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—118 **7 Claims**

1. A device for reducing high negativity within an underwater drainage device comprising, in combination a housing including a syringe needle and having a passageway therethrough to atmosphere, underwater drainage device, a resealable portion in the underwater drainage device which fluidly communicates with the negative pressure therein and which is pierced by said syringe needle, valve means disposed in said passageway to provide a closable passageway from atmosphere through the housing and syringe needle during use, and spring means for urging the valve means to a closed position



when the degree of negativity to which the syringe needle is exposed is less than a predetermined value and whereby the valve means opens when the degree of negativity to which the syringe needle is exposed is greater than the predetermined value.

4,481,009

POLYMER INCORPORATION INTO IMPLANTABLE BIOLOGICAL TISSUE TO INHIBIT CALCIFICATION

Aws S. Nashef, Costa Mesa, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed May 13, 1982, Ser. No. 377,747

Int. Cl.³ A61L *17/00;* **A63B** *51/02;* **D01C** *3/00;* **D01F** *5/00*

U.S. Cl. 8—94.11 **31 Claims**

1. A process for treating animal biological tissue prior to implantation in an animal to reduce calcification of said tissue after implantation comprising the steps of:

(a) fixing said tissue under tissue fixing conditions;

(b) contacting said fixed tissue with a first solution of a monomer capable of further polymerization for a time sufficient to covalently bind said monomer directly to the tissue; and

(c) contacting said tissue with a second monomer solution under polymerization conditions such that said second monomer polymerizes with said first monomer bound to said tissue in an amount effective in reducing calcification of said tissue after implantation.

4,481,010

NON-CORROSIVE CREOSOTE AND SOOT REMOVING COMPOSITION

Leonard S. Mackowiak, East Hanover; Frank E. Ellison, Convent Station, both of N.J.; Jay W. Fidler, Port Chester, N.Y.; N. George Tucker, River Vale, and Gangdhar M. N. Varma, Lodi, both of N.J., assignors to Hercules Chemical Company, Inc., New York, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,844

Int. Cl.³ C10L *10/04, 10/06;* **C23F** *11/18*

U.S. Cl. 44—5 **13 Claims**

1. A non-corosive creosote and soot removing composition comprising a metallic chloride for removing creosote and soot deposits and from about 20 to 60 weight percent of trisodium phosphate dodecylhydrate as a corrosion inhibitor.

4,481,011

COKE OVEN CHARGE MIXTURES WITH COAL BINDER

Wilhelm Weskamp, Wattenscheid, and Wilhelm Stewen, Dortmund-Eichlinghofen, both of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellscaft, Essen, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 431,215

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **8 Claims**

1. A processs of preparing a coal mixture utilizing coal in a fine grain particulate form for charging into a coke oven, comprising the steps of:

mixing the coal with a binding agent selected from the group consisting of carbo pitch, residues of coal oil refining, and oil refining residues, to produce a mixture,

adding 0.1–0.3% by weight of light fuel oil to said mixture of coal and binder,

effecting said light fuel oil addition to the coal and binder mixture by atomization of the oil into a free-falling stream of the mixture, and

causing agglomeration of said mixture.

4,481,012

PROCESS FOR THE PRODUCTION OF A MIXTURE OF METHANOL AND HIGHER ALCOHOLS OF "FUEL GRADE"

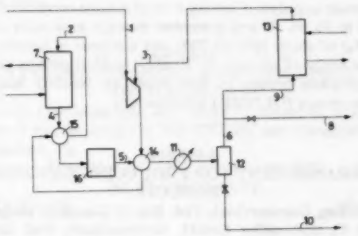
Raffaele di Pietro, Milan; Alberto Paggini, Spino d'Adda, and Vincenzo Lagana', Milan, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 269,708, Jun. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 215,172, Dec. 11, 1980, abandoned. This application Jul. 18, 1983, Ser. No. 514,544

Claims priority, application Italy, May 16, 1980, 22116 A/80

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—53 **14 Claims**



1. In a continuous process for the production of a fuel grade mixture consisting essentially of methanol, higher alcohols and traces of water, which process comprises feeding a gaseous mixture consisting essentially of carbon monoxide and hydrogen to a synthesis reactor, said reactor operating at a temperature of about 200° C. to about 500° C. and a pressure higher than 30 atm; reacting said gaseous mixture in said synthesis reactor to form a reaction mixture which consists essentially of methanol, higher alcohols, water and unreacted gases; and cooling said reaction mixture, the improvement which comprises:

(a) feeding said cooled reaction mixture to a conversion reactor which operates at substantially the same pressure as said synthesis reactor and a temperature of from about 150° C. to about 250° C.;

(b) reacting in said conversion reactor the carbon monoxide and water in said cooled reaction mixture to form carbon dioxide and hydrogen according to the conversion reaction

$$CO + H_2O \rightleftarrows CO_2 + H_2$$

to form a reaction product consisting essentially of methanol, higher alcohols, unreacted starting gases; carbon dioxide and traces of water;

(c) cooling said reaction product to form a liquid phase comprising said fuel grade mixture and a gaseous phase consisting essentially of carbon monoxide, hydrogen and carbon dioxide;

(d) separating said liquid phase and said gaseous phase;

(e) removing carbon dioxide from said gaseous phase;

(f) recycling the gaseous phase product from step (e) to said synthesis reactor as said gaseous feed mixture.

4,481,013

TWO COMPONENT FLOW IMPROVER ADDITIVE FOR MIDDLE DISTILLATE FUEL OILS

Robert D. Tack, Abingdon; Kenneth Lewtas, Wantage, and Brian W. Davies, Abingdon, all of United Kingdom, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 23, 1982, Ser. No. 360,929

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—62 **10 Claims**

1. A wax containing middle distillate fuel oil, boiling in the

range of about 120° C.–500° C., which has been improved in its low temperature properties by the addition of 0.005 to 0.5 wt. % of a two-component flow and filterability improver additive system which is synergistic in said oil consisting essentially of:

(a) within the range of about 25 to 95 wt. %, based on a total weight of flow improver, of a C_{30}–C_{300} oil-soluble nitrogen compound wax crystal growth inhibitor having at least one straight C_8–C_{40} alkyl chain and being selected from the class consisting of amine salts and/or amides of aromatic or cycloaliphatic polycarboxylic acids or anhydrides thereof or the amide/amine salts of monoesters of said polycarboxylic acids the acids having 5–13 carbon atoms in the cyclic moiety, and

(b) in the range of about 75 to 5 wt. % of an ethylene vinyl acetate copolymer having a vinyl acetate content of about 10 to 20 wt. % and a number average molecular weight (M_n) of about 1500 to 7000 and a degree of branching in the range of about 1 to 20 alkyl methyl groups per 100 methylene groups as determined by Nuclear Magnetic Resonance (^{1}H NMR) spectroscopy.

4,481,014
ARRANGEMENT FOR PRODUCING GASEOUS PRODUCTS

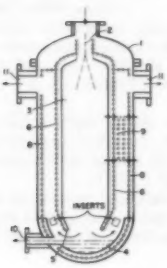
Rolf Dörling, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,337

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107156

Int. Cl.³ C10J 3/08

U.S. Cl. 48—76 9 Claims



1. An arrangement for producing gaseous products from solid and liquid, ash-containing fuels and mixtures thereof in an air stream in a reactor, said arrangement in combination comprising:

a reactor provided with an inlet means which permits introduction of said fuel parallel to the axis of said reactor, said fuels being reacted in said reactor to form gaseous products which contain solid and liquid ash constituents;

a slag bath located beneath said reactor for receiving solid and liquid ash constituents, extensively separated-off from said gaseous products, prior to any further cooling-off of said gaseous products and with that to prevent any fouling therein;

a discharge outlet means associated with said slag bath for carrying off said separated-off solid and liquid ash constituents;

at least two spaced apart heat exchanger heating surfaces which concentrically surround said reactor and structurally form at least one annular chamber for open passage therebetween; deflection means for reversal in direction of said flow from said reactor to the annular chamber by 180°, said heating surface being kept from fouling due to any solid and liquid ash constituents positively separated due to said reversal in direction prior to reaching said heat exchanger heating surfaces, said at least one annular chamber being arranged in such a way that it receives a flow of said gaseous products from said reactor only after a reversal in direction of said flow by 180°, said gaseous products when extensively cleansed of solid and liquid as constituents then being cooled in said at least one annular chamber by giving off heat to said heat exchanger heating surfaces; and

an outlet connection associated with said at least one annular chamber for the discharge of cooled-off gaseous products therefrom.

4,481,015
COAL-WATER SUSPENSIONS, A METHOD FOR THEIR PRODUCTION, AND THEIR USE

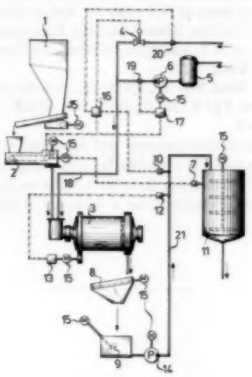
Jürgen Lusch, Oberhausen; Bernhard Lieder, Bottrop; Heinrich Heinen, Oberhausen, and Wolfgang Kolodzey, Duisburg, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 382,993

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121979

Int. Cl.³ C10L 1/32; C10J 3/46

U.S. Cl. 48—202 9 Claims



1. A process for producing a coal-water suspension useful as a feed for coal gasification which comprises mixing coal and water in a packed mill in a ratio corresponding to the ratio of the desired suspension, passing said coal-water suspension from said packed mill to another vessel, simultaneously mutually adjusting the density and viscosity of the resultant coal-water suspension by determining the density of said suspension after leaving said mill, regulating the amount of water to said mill at constant coal addition in response to a change in density of said suspension, wherein if the density of the suspension decreases, the amount of water is decreased; determining the viscosity of said suspension after leaving said mill and changing the speed of rotation of said mill in response to a change in the density; wherein if the viscosity of the suspension drops, the speed of rotation of the mill is increased.

6. A process according to claim 1 wherein said coal-water suspension is thereafter fed to a coal gasification reactor without substantially changing the relative amount of coal and water in said suspension.

4,481,016
METHOD OF MAKING TOOL INSERTS AND DRILL BITS

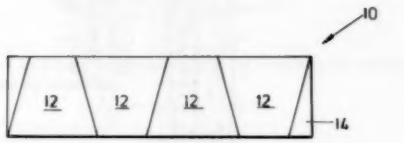
Nicoll A. D. Campbell, 54 Kerry Rd., Parkview, Johannesburg, Transvaal; Henry B. Dyer, 28 George St., Bryanston, Sandton, Transvaal; Rainer Dietrich, 101, 6th St., Linden, Johannesburg, Transvaal; Cornelius Phaal, 14 Robant La., Rivonia, Sandton, Transvaal, all of South Africa, and Douglas J. Reid, 97 Tradaree Ct., Shannon, County Clare, Ireland

Continuation of Ser. No. 65,324, Aug. 9, 1979, abandoned. This application Nov. 30, 1981, Ser. No. 325,661

Claims priority, application South Africa, Aug. 18, 1978, 78/4716; Dec. 19, 1978, 78/7087; Dec. 27, 1978, 78/7291; Feb. 21, 1979, 79/0814

Int. Cl.³ B24B 1/00

U.S. Cl. 51—295 2 Claims



1. A wire-drawing die insert comprising an abrasive compact fragment selected from the group consisting of diamond and cubic boron nitride in the shape of a truncated pyramid or a truncated cone and having a centrally located hole extending from the base to the truncated apex and suitably embedded in a metal or cemented carbide support so that the direction of wire drawing will be from the base to the truncated apex.

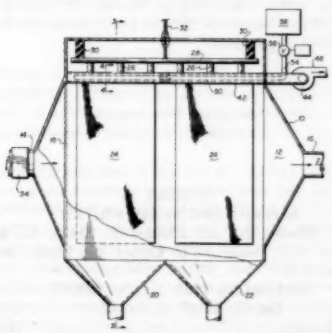
4,481,017
ELECTRICAL PRECIPITATION APPARATUS AND METHOD

Dale A. Furlong, Roanoke, Va., assignor to ETS, Inc., Roanoke, Va.

Filed Jan. 14, 1983, Ser. No. 458,055

Int. Cl.³ B03C 3/47, 3/49, 3/80

U.S. Cl. 55—12 23 Claims



1. In a method for the electrical precipitation of particles from gases wherein a gas stream containing said particles is passed through an enclosed contact zone having an electrostatic field causing said particles to migrate from the gas stream toward a collecting surface comprising a gas filter pervious to gas flow and substantially impervious to passage of solid particles on which said particles collect, the improvement comprising passing a portion of said gas stream through said enclosed contact zone without passage through said filter and withdrawing another portion of said stream through said filter to thereby facilitate adherence of the collected particles to the surface of said filter.

8. An electrical precipitating apparatus comprising a chamber having an inlet and an outlet for flow of gases, said chamber having therein at least one collecting electrode comprising a filter pervious to gas flow and substantially impervious to passage of solid particles, means in said chamber for establishing an electrostatic field to cause particles suspended in said gases to migrate from said gases toward the surface of said collecting electrode, means for passing a portion of said gases through said chamber without passage through said filter and means for withdrawing another portion of said gases through said filter to facilitate adherence of said particles to the surface of said filter.

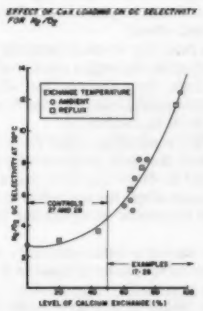
4,481,018
POLYVALENT ION EXCHANGED ADSORBENT FOR AIR SEPARATION

Charles G. Coe, Macungie, and Steven M. Kuznicki, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 15, 1982, Ser. No. 441,822

Int. Cl.³ B01D 53/04

U.S. Cl. 55—68 45 Claims



1. A polyvalent ion exchanged adsorbent composition comprising at least 50% by weight faujasite and the faujasite portion thereof having a majority of its exchangeable ion capacity in the polyvalent form prepared by aprocess which comprises:

(a) ion exchanging said faujasite-containing composition with polyvalent ions, and

(b) thermally activating the polyvalent exchanged composition to remove a substantial portion of its zeolitic water in said composition in such a manner as to produce a preponderance of said polyvalent ions in a dehydrated/dehydroxylated state under conditions to minimize the water vapor pressure throughout this step by subjecting the polyvalent exchange composition containing up to about 30% by weight of water to pressures in the range of about 0.1 to 10 atmospheres while maintaining a flow of a nonreactive purge gas at a molar mass velocity of about 0.5 to 100 kg. mole/m^2-hr. and a residence time of no greater than about 2.5 minutes, heating said composition at a temperature ramp of 0.1° to 40° C./min. up to temperatures at least about 300° C. and no greater than 650° C. and maintaining said composition at these temperatures for a period such that the resulting nitrogen capacity and selectivity ratio of the resulting polyvalent exchanged composition for the separation of a binary mixture of oxygen and nitrogen is substantially greater than such a polyvalent ion exchanged composition that has not undergone such a thermal activation step.

16. The use of the composition of claim 1 in the separation of air into nitrogen and oxygen.

4,481,019

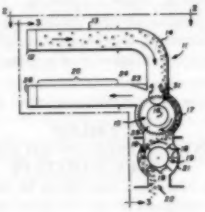
METHOD AND APPARATUS FOR EXTRACTING SOLIDS FROM A GAS STREAM FLOWING IN A PNEUMATIC TRANSPORT LINE

Frederick E. Moreno, 1386 Holt Ave., Los Altos, Calif. 94022

Filed May 26, 1981, Ser. No. 267,378

Int. Cl.³ B01D *45/08, 45/16;* **B65G** *53/60*

U.S. Cl. 55—96 **9 Claims**



1. A method for separating solids out of a gas stream flowing in a pneumatic transport line, including the steps of:

passing the solids entrained in a stream of gas in the pneumatic transport line over a revolving toothed extractor wheel to cause solids to be picked out of the stream by the revolving toothed wheel;

doffing the solids from the toothed extractor wheel; and

passing the doffed solids through a rotary valve for removing the solids from the transport line while sealing the pressure of the pneumatic transport line from the pressure on the other side of said valve.

5. An apparatus for separating solids out of a gas stream flowing in a pneumatic transport line, including:

gaseous duct means having a gas inlet and a gas outlet for containing a stream of gas having solids entrained therein and forming the pneumatic transport line for transporting solids;

solids duct means having a solids inlet and a solid outlet for containing a flow of solids and connected in gas communication with the pneumatic transport line;

toothed extractor means in gas flow communication with said solids duct means and said gaseous duct means between said gas inlet and gas outlet of said gaseous duct means and for revolution about an axis of revolution thereof for picking solids out of the stream of gas passing by the revolving toothed extractor means;

rotary valve means connected in gas communication with said solids duct means between said solids inlet and solids outlet and having a plurality of vanes for sealing the pressure of the pneumatic transport line from the pressure on the solids outlet side of said valve means and being constructed and arranged to doff the solids from said toothed extractor means and for passing the doffed solids through said solids duct means to said solids outlet whereby the solids are removed from the pneumatic transport line while maintaining the pressure of the pneumatic transport line relative to ambient.

4,481,020

LIQUID-GAS SEPARATOR APPARATUS

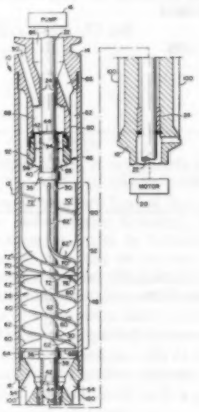
Lawrence C. Lee; Mukul K. Tyagi; Michael W. Furnas, and Francis T. Traylor, all of Bartlesville, Okla., assignors to TRW Inc., Cleveland, Ohio

. This application Jun. 10, 1982, Ser. No. 386,968

Int. Cl.³ B01D *45/00*

U.S. Cl. 55—203 **39 Claims**

1. Liquid-gas separator apparatus comprising a housing having an inlet for a liquid-gas fluid mixture and having first and second outlets for separated liquid and gas, respectively, helical blade means defining screw inducer means in the housing for pressurizing a liquid-gas fluid mixture entering the housing through the inlet, elongated vane means defining centrifugal separator means in the housing for separating liquid and gas components of the fluid mixture, blade segment means defining transition means disposed in the housing intermediate the screw inducer means and the centrifugal separator means for conveying the fluid mixture smoothly from the screw inducer means to the centrifugal separator means while minimizing pressure loss, and means for separately conveying separated liquid and gas components of the fluid mixture to said first and second outlets, respectively, the blade segment means of the transition means being formed and related to the helical blade means of the screw inducer means and to the vane



means of the centrifugal separator means so as to define a transition flow path that is free of abrupt changes in flow direction and that smoothly and continuously changes the direction of flow of the fluid mixture from the helical blade means of the screw inducer means to a direction of flow substantially along the length of the vane means of the centrifugal separator means, the helical blade means of the screw inducer means being formed to pressurize the fluid mixture sufficiently to provide a pressurized fluid flow through the housing and to maintain positive liquid and gas exit pressures at said first and second outlets, respectively.

4,481,021

ROTARY DRUM AIR FILTER

William L. Kinney, Jr., and Richard E. Evans, Jr., both of Charlotte, N.C., assignors to United Air Filter Company, Charlotte, N.C.

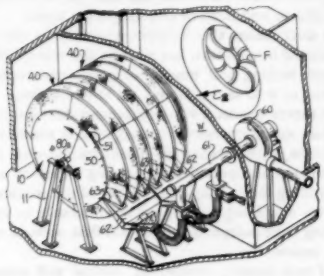
Filed Jan. 20, 1983, Ser. No. 459,472

Int. Cl.³ B01D *46/04, 46/26*

U.S. Cl. 55—290 **11 Claims**

2. An air filter drum assembly comprising a generally cylindrically shaped skeletal framework having an axis of rotation, a plurality of perforated filter media supporting modular units of arcuate shape supported by said cylindrical framework, said arcuate shaped modular units each comprising a plurality of side-by-side arcuate support segments, each segment having sloping opposing sides arranged in radially outwardly converging relationship, and said plurality of arcuate shaped modular units being circularly arranged so that the arcuate support segments thereof collectively define a plurality of side-by-side substantially circular filter media support members with slop-

ing sides projecting radially outwardly from and circumscribing said cylindrical framework, and pliable filter media secured



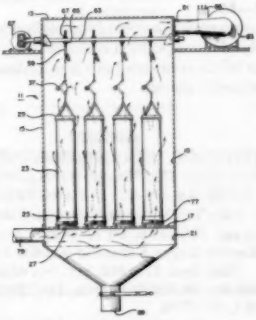
to and overlying said circular support members for rotative movement therewith.

4,481,022

FILTER BAG ASSEMBLY

Gerald J. Reier, P.O. Box 79141, Fort Worth, Tex. 76179

Filed Dec. 9, 1983, Ser. No. 559,941
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—341 R **10 Claims**



1. An improved filter bag assembly for a filter housing having a plurality of filter bags, each of said filter bags being anchored at a lower end and being suspended within said housing in tensioned relation by an upper end thereof, comprising:

a bag spring attached at one side to said bag upper end and having an opposite spring side, said bag spring being tensionable between tensed and relaxed positions;

a flexible strap having a spring engaging end attached to said bag spring opposite spring side and having a free end; and

hanger means suspended within said filter housing, said flexible strap free end being engageable with said hanger means when said bag spring is tensed whereby relaxing said spring serves to tense said filter bag.

4. An improved filter bag assembly for a filter housing having a plurality of filter bags, each of said filter bags being anchored at a lower end and being suspended within said housing in tensioned relation by an upper end thereof, comprising:

a reinforcing member within each of said filter bag upper ends;

a bag end extending upwardly from said reinforced upper end;

a butterfly-shaped bag spring attached at one side to said bag upper end and having an opposite spring side, said bag spring being tensionable between tensed and relaxed positions;

a flexible strap having a spring engaging end attached to said bag spring opposite spring side and having a free end; and

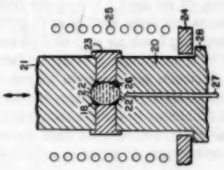
a curved bolt mounted at one end within said filter housing and having an opposite loop portion, said flexible strap free end being engagable with said loop portion when said bag spring is tensed whereby relaxing said spring serves to tense said filter bag.

4,481,023

PROCESS TO MOLD PRECISION GLASS ARTICLES

Jean-Pierre Marechal, Grez-sur-Loing, France, and Richard O. Maschmeyer, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 316,861, Oct. 31, 1981, abandoned.
This application Jul. 20, 1983, Ser. No. 515,662
Int. Cl.³ C03B *23/00*
U.S. Cl. 65—64 **8 Claims**



1. A process for molding a glass lens having dimensional tolerances finer than 0.1% and surface figure tolerances finer than 0.2 λ/cm in the visible range of the radiation spectrum, which comprises the steps of:

(a) preparing a mold having the precise internal configuration to produce said desired dimensional and surface figure tolerances in said glass lens;

(b) preparing a glass preform closely matching the configuration of said mold;

(c) exposing said preform to a temperature at which said glass exhibits a viscosity within the range of 10^8–10^{12} poises until said preform or a part thereof is heated to said temperature;

(d) exposing said mold to a temperature substantially the same as that of said glass preform until said mold is heated to said temperature;

(e) then placing said preform inside said mold;

(f) applying a load to said mold with said preform therewithin, while said mold and at least that part of said preform in the vicinity of said mold are at substantially the same temperature, that temperature being within the range at which said glass exhibits a viscosity of 10^8–10^{12} poises, to force said preform into conformity with the surface of said mold to produce said glass lens of said dimensional and surface figure tolerances;

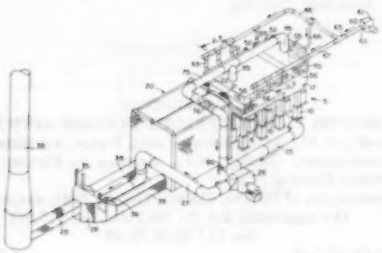
(g) removing said glass lens from said mold at a temperature where said glass exhibits a viscosity of at least 10^{11}, but not more than 10^{13}, poises; and thereafter

(h) fine annealing said glass lens to develop a controlled, uniform, and isotropic refractive index therein while retaining said dimensional and surface figure tolerances.

4,481,024
HEAT RECOVERY SYSTEM FOR GLASS TANK FURNACES

Lloyd G. Bly, Roselle, Ill., assignor to M. H. Detrick Company, Itasca, Ill.

Filed Oct. 22, 1982, Ser. No. 436,183
Int. Cl.³ C03B 5/235
U.S. Cl. 65—337 **7 Claims**

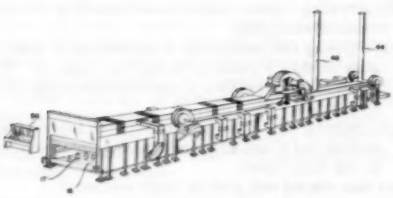


1. In a glass tank furnace having burners, a melting tank, a refining tank and a refractory enclosure, including a crown, for the burners, melting tank and refining tank, the combination therewith of a heat recovery system, comprising: a heat recovery plenum means mounted on top of the furnace crown; an air blower having an air inlet for exterior fresh air and an outlet; first duct means between said blower outlet and said plenum means for directing fresh air into said plenum means where the air is heated by heat escaping from the furnace crown; second duct means between said plenum means and the furnace for directing heated air to the burners for use as combustion air, whereby the efficiency of the furnace is enhanced significantly, the heated air from said second duct means being mixed with additional combustion air prior to entering the furnace.

4,481,025
GLASS ANNEALING LEHR

Federico B. Rodriguez, Garza Garcia, and Rafael B. Mares, Roma Monterrey, both of Mexico, assignors to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Sep. 29, 1982, Ser. No. 426,615
Claims priority, application Mexico, Dec. 15, 1981, 191449
Int. Cl.³ C03B 25/06
U.S. Cl. 65—348 **1 Claim**



1. A lehr for the thermal treatment of glass comprising:
a plurality of hollow modules aligned and connected to each other to define an elongated tunnel lehr having heating, tempering, and critical, intermediate and rapid cooling zones in the order named within said tunnel;
conveyor means within said tunnel and extending completely therethrough for transporting articles to be treated so that the articles pass successively through said zones in the order named and are gradually heated, then tempered and finally cooled in the respective zones;
means defining a principal air source located externally on the lehr;
first duct means located externally on the lehr and connecting said principal air source means with the interior of the lehr at points beneath said conveyor to contact articles thereon in said heating and tempering zones;
heating means located in said first duct means to heat the air supplied to said heating and tempering zones;
second duct means also located externally on the lehr and connected to withdraw hot air from the interior of the lehr in said heating and tempering zones and recirculate a portion of it to said principal air source means;
suction means connected to said second duct means;
third duct means connected to said suction means to supply a portion of the heated air in said second duct means to said critical and intermediate cooling zones for uniformly controlling the cooling temperature of the articles therein;
means for supplying cooling air continuously to said rapid cooling zone independently of said first, second, and third duct means; and
each of said heating, tempering, critical and intermediate zones of said lehr having means for controlling the temperatures therein.

4,481,026
ALUMINUM N-PHOSPHONOMETHYLGLYCINE AND ITS USE AS A HERBICIDE

Michael P. Prisbylla, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 442,067, Nov. 16, 1982, abandoned. This application Oct. 17, 1983, Ser. No. 541,504
Int. Cl.³ E05B 65/46; C07F 5/06
U.S. Cl. 71—86 **11 Claims**

1. The compound aluminum N-phosphonomethylglycine.

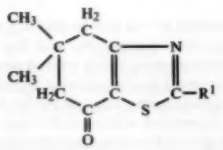
4. A herbicidal composition comprising a herbidically effective amount of the compound of claim 1 admixed with at least one inert adjuvant carrier.

4,481,027
DERIVATIVES OF TETRAHYDROBENZOTHIAZOLE AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME AS AN ACTIVE INGREDIENT

Katsumichi Aoki; Yoichi Kanda; Takafumi Shida; Keigo Satake, and Hiroyasu Shinkawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

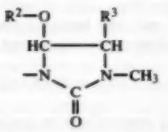
Filed Dec. 21, 1982, Ser. No. 451,796
Claims priority, application Japan, Dec. 24, 1981, 56-215628; May 10, 1982, 57-77798
Int. Cl.³ C07D 417/04; A01N 43/78
U.S. Cl. 71—90 **16 Claims**

1. A derivative of tetrahydrobenzothiazole represented by the general formula (I):



(I)

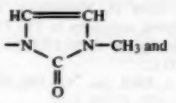
wherein R^1 represents one of the following groups:



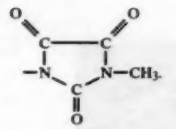
(II)

wherein R^2 represents a hydrogen atom, methyl group, acetyl group, benzoyl group, phenoxycarbonyl group or 3-pyridyl-

carbonyl group and R^3 represents a hydrogen atom, hydroxy group, methoxy group or acetoxy group,



(III)



(IV)

4,481,028

Patent Not Issued For This Number

4,481,029

TRIAZINYL-SULFONYL-UREAS AND ISOUREAS

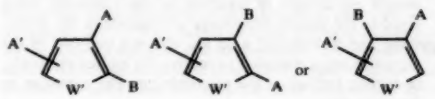
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 196,276, Oct. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 98,723, Nov. 30, 1979, abandoned. This application Dec. 16, 1982, Ser. No. 450,214

Int. Cl.[3] **C07D** *405/12, 405/14;* **A01N** *43/70, 43/68*

U.S. Cl. 71—93 **79 Claims**

1. A compound selector from:

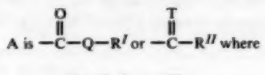


I II III

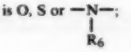
wherein

W' is O or S;

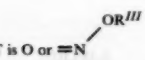
A' is H, Cl, Br, C_1–C_4 alkyl, OCH_3, NO_2 or CF_3;



A is —C(=O)—Q—R^I or —C(=T)—R^{II} where



Q is O, S or —N(—R_6)—;



T is O or =N—OR^{III}

where R^{III} is H, C_1–C_4 alkyl or C_3–C_4alkenyl;

when Q is O or S then

R^I is C_1–C_6 alkyl; C_3–C_6 alkenyl; C_3–C_6 alkynyl; C_2–C_6 alkyl substituted with 1-3 Cl, F or Br, or one of CN or OCH_3; C_3–C_6 alkenyl substituted with 1-3 Cl; C_3–C_6 alkynyl substituted with Cl; C_5–C_6 cycloalkyl; cyclohexenyl; cyclohexyl substituted with 1-3 CH_3; C_4–C_7 cycloalkylalkyl or

where R_7 and R_8 are independently H, Cl, CH_3, or OCH_3;

n is 0 or 1; and

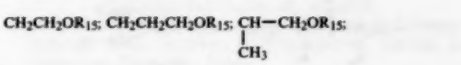
R^9 is H or CH_3;

when Q is O then

R^I is

$CH_2CH_2OR_{15}$; $CH_2CH_2CH_2OR_{15}$; CH(—CH_3)—CH_2OR_{15};

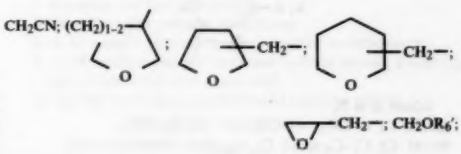
where R_{15} is C_2H_5, $CH(CH_3)_2$, phenyl, CH_2CH_2Cl,



CH_2CCl_3; —$(CH_2CH_2O)_{n'}R_{16}$; CH(—CH_3)—$CH_2O)_{n'}R_{16}$;

where

R^{16} is CH_3, C_2H_5, $CH(CH_3)_2$, phenyl, CH_2CH_2Cl, CH_2CCl_3, and n' is 2 or 3;

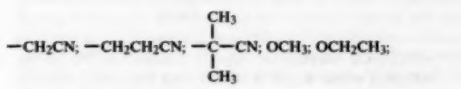


CH_2CN; $(CH_2)_{1-2}$; CH_2—; CH_2—; CH_2—; CH_2OR_6';

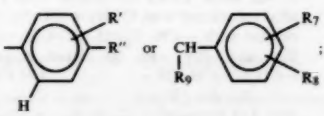
where R_6' is C_1–C_4 alkyl; provided R^I has a total of ≦13 carbon atoms; when Q is

then

R^I is H; C_1–C_6 alkyl; —$CH_2CH_2OR_{10}$; —$CH_2CH_2CH_2OR_{10}$; where R_{10} is CH_3, CH_3CH_2, $CH(CH_3)_2$, or phenyl; C_3–C_6 alkenyl; C_3–C_6 cycloalkyl; C_5–C_6 cycloalkenyl; C_6 cycloalkyl substituted with any one of 1–2 OCH_3, 1–3 CH_3, —CH_2CH_3 or CF_3; C_4–C_7 cycloalkylalkyl;



—CH_2CN; —CH_2CH_2CN; —C(—CH_3)(—CH_3)—CN; OCH_3; OCH_2CH_3;



where R' is H, C_1–C_4 alkyl, OCH_3, F, Cl, Br, CN, NO_2 or CF_3;

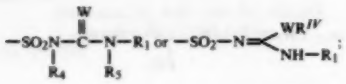
R'' is H, CH_3, Cl, F or Br;

R_7, R_8 and R_9 are as previously defined; R_6 is N, C_1–C_3 alkyl; CH_2CN; CH_2CH_2—CN or —CH_2—CH=C_2 and R_6 and R^I may be taken together to form —$(CH_2)_4$—, —$(CH_2)_5$— or —CH_2CH_2O—CH_2CH_2—; with the proviso that when R_6 is CH_2CH_2CN or CH_2CN, then R^I is CH_2CH_2CN or CH_2CN; and R^I and R_6 have a total carbon atom count of ≦13; and when R^I is OCH_3 or OCH_2CH_3 then R_6 is CH_3 or H; when A is

then R^{II} is H, C_1–C_6 alkyl; C_3–C_6 alkenyl; phenyl; benzyl; benzyl or phenyl substituted with 1–2 Cl, 1–2 OCH_3, 1–2 CH_3; C_5–C_6 cycloalkyl; C_4–C_7 cycloalkylalkyl with the

proviso that when T is $=N-OR^{III}$, then R^{II} must be C_1–C_6 alkyl or C_3–C_6 alkenyl;

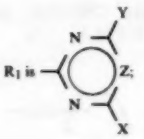
B is



where R_4 is H or CH_3; W is O or S; R_5 is H, or CH_3; with the further proviso that either

R_4 or R_5 must be H;

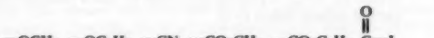
R^{IV} is C_1–C_6 alkyl or C_3–C_4 alkenyl;



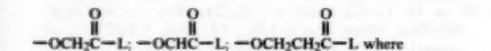
where Z is N;

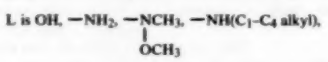
X=H, Cl, $-CH_3$, $-OCH_3$ or $-OCH_2CH_3$;

Y=H; Cl; C_1–C_4 alkyl; C_1–C_4 alkyl substituted with

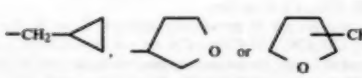


or 1–3 atoms of F, Cl, Br; C_3–C_4 alkenyl; $-O-(CH_2)_{n'}O-(C_1$–C_3 alkyl) where n' is 2 or 3;





$-N(C_1$–C_4 alkyl$)_2$ or C_1–C_6 alkoxy; SCN; $-N_3$; $NR_{11}R_{12}$ where R_{11} is H or CH_3 and R_{12} is H, $-OCH_3$, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_4 alkenyl, C_2–C_3 alkyl substituted with OCH_3 or OC_2H_5, C_1–C_2 alkyl substituted with —CN, CO_2H, CO_2CH_3 or $CO_2C_2H_5$, and R_{11} and R_{12} can be taken together to form $-CH_2CH_2CH_2CH_2-$ or $CH_2CH_2OCH_2CH_2-$; —O—R_9 where R_9 is C_1–C_4 alkyl, C_2–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br, C_1–C_2 alkyl substituted with cyano, C_3–C_4 alkenyl, $-CH_2C{\equiv}CR_{13}$,



R_{13} is H, CH_3 or CH_2Cl; SR_{14}; where R_{14} is C_1–C_4 alkyl, allyl, propargyl or C_1–C_2 alkyl substituted with CN; with the proviso that when X and Y are both H, then

R^I and R^{II} are less than 5 carbons;

and further provided that when A contains greater than 5 carbons atoms, then Y must contain ≦4 carbon atoms, and their agriculturally suitable salts.

44. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **1**.

4,481,030

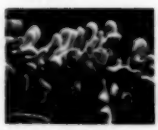
TANTALUM-COPPER ALLOY AND METHOD FOR MAKING

Frederick A. Schmidt; John D. Verhoeven, and Edwin D. Gibson, all of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,102

Int. Cl.³ C22B *4/00*

U.S. Cl. 75—10 C **8 Claims**



1. A method of making a tantalum-copper alloy comprising:

preparing a consumable electrode consisting of an elongated copper billet containing at least two spaced apart tantalum rods extending longitudinally the length of the billet, the weight percentage of tantalum in the electrode being equal to the weight percentage of tantalum in the alloy;

striking and maintaining a dc arc between one end of the electrode and a container to receive the molten electrode, to initiate melting of the electrode into the container to form the alloy;

controlling the distance between the end of the electrode and the molten alloy in order to melt the tantalum at about the same rate as the copper is melted, so that as the electrode is melted a molten homogeneous mixture of tantalum and copper is formed in the receiver; and,

cooling the molten homogeneous mixture of copper and tantalum thereby forming a tantalum-copper alloy.

4,481,031

MANUFACTURE OF ALUMINIUM-SILICON ALLOYS

Sune Eriksson, Hofors, Sweden, assignor to SKF Steel Engineering AB, Hofors, Sweden

Filed Aug. 25, 1983, Ser. No. 526,439

Claims priority, application Sweden, Oct. 22, 1982, 8206002

Int. Cl.³ C22B *4/00*

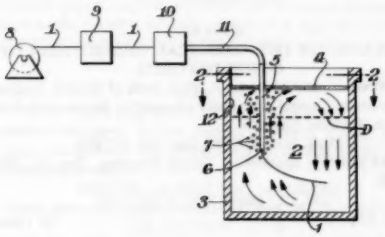
U.S. Cl. 75—10 R **8 Claims**

1. A method of manutacturing an aluminium-silicon alloy from natural mineral containing alumina and silica and carbon powder, which comprises injecting (a) the natural mineral in powder form in a carrier gas and (b) a reducing agent in the form of a carbon carrier into a plasma gas produced in a plasma generator, and introducing the mineral thus heated, together with the reducing agent and the energy-rich plasma gas, into a reaction chamber surrounded substantially on all sides by solid reducing agent in lump form.

4,481,032
PROCESS FOR ADDING CALCIUM TO A BATH OF MOLTEN FERROUS MATERIAL

Joseph G. Kaiser, Branford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 12, 1983, Ser. No. 522,754
Int. Cl.³ C21C 7/02
U.S. Cl. 75—58 9 Claims



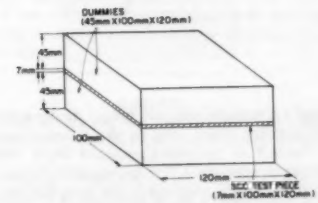
1. A process for adding calcium to a bath of molten ferrous material which comprises feeding a calcium metal-containing wire having a lower density than said ferrous material downwardly through a refractory lance inserted into said bath while providing a sufficient flow of inert gas through said lance to maintain the lance essentially free of said molten ferrous material and to induce substantial recirculatory stirring of said molten material,

with the disposition of the lance in said bath and the composition, cross-sectional dimensions and feeding rate of said wire being such that (a) said wire bends substantially towards the horizontal direction after exiting from the wire outlet of said lance and before fully decomposing, and (b) at least a major part of the desolidification of the calcium in said wire occurs by melting in or directly below a region of downwelling of said molten ferrous material at a depth below the surface of said bath at which the ferrostatic pressure is greater than the vapor pressure of calcium at the temperature of said molten ferrous material.

4,481,033
HIGH MN-CR NON-MAGNETIC STEEL

Kazuo Fujiwara, Kobe; Kiyoshi Sugie, Akashi, and Fujiko Uetani, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 2, 1982, Ser. No. 364,871
Claims priority, application Japan, Apr. 3, 1981, 56-50203; Apr. 3, 1981, 56-50204
Int. Cl.³ C22C 38/40
U.S. Cl. 75—128 A 3 Claims



1. A high Mn-Cr non-magnetic steel having good resistance to stress corrosion cracking and having a magnetic permeability which is uniformly less than 1.02, which consists essentially of the following elements in percentage by weight: 0.05–0.18% of carbon; up to 1.0% of silicon; 16–25% of manganese; 14–17% of chromium; 0–0.8% of vanadium; 0.3–0.6% of nitrogen; 0.06–0.3% of nickel; and the balance of iron and inevitable impurities.

4,481,034
PROCESS FOR PRODUCING HIGH HAFNIUM CARBIDE CONTAINING ALLOYS

Nicholas J. Grant, Winchester, Mass., and Ramon K. Robinson, Bellevue, Wash., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 381,363, May 24, 1982, , which is a continuation-in-part of Ser. No. 165,630, Jul. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 664,207, Mar. 3, 1976, abandoned, which is a continuation-in-part of Ser. No. 371,318, Jun. 18, 1973, abandoned. This application Sep. 13, 1982, Ser. No. 417,671
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.³ C22C 19/08
U.S. Cl. 75—236 3 Claims

1. An alloy product comprising:

A. 10–30 weight percent chromium;

B. 4–12 weight percent tungsten and/or molybdenum;

C. 2–24 volume percent hafnium carbide having a particle size of less than 3 microns; and,

D. the balance being a cobalt solid solution matrix.

4,481,035
CHEMICAL GILDING BATH

Ernst Andrascek; Hans Hadersbeck, and Friedhelm Wallenhorst, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,374
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237394
Int. Cl.³ C23C 3/02
U.S. Cl. 106—1.23 8 Claims

1. In a chemical, auto-catalytical gilding bath for electrodeless gilding of metals and having an amount of a water-soluble alkali gold cyanide complex therein which functions in the alkaline pH range and having a compatible reducing agent and a compatible stabilizing agent therein, the improvement comprises employing as said reducing agent an organic compound having at least one enol group in the molecule thereof and also employing as said stabilizing agent ethylene diamine tetraacetic acid tetrasodium salt, and adjusting the pH of said bath with a buffer solution so as to have a value ranging between about 7.5 and 12.

4,481,036
GLAZE FOR USE ON NON-METALLIC DENTAL COPINGS

Carlino Panzera, Belle Mead, N.J., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed Mar. 9, 1983, Ser. No. 473,469
Int. Cl.³ C09K 3/00
U.S. Cl. 106—35 1 Claim

1. A translucent dental glaze composition suitable for application to a dental porcelain ceramic substrate, said glaze having a maturing temperature of from about 1700° to about 1900° F., and a coefficient of thermal expansion of from about 4 to about 9×10^{-6} in./in./°C., and consisting of, on a weight basis, the following components:

Component	Proportion, %
SiO_2	71–74
Al_2O_3	10–12
K_2O	4–5
Na_2O	4–5
CaO	2–4.5
B_2O_3	3.5–5.5

4,481,037

CEMENT COMPOSITIONS

James Beale, Lichfield, and Robert F. Viles, Tamworth, both of England, assignors to Fosroc International Limited, Birmingham, England

Filed Jun. 3, 1983, Ser. No. 500,867

Claims priority, application United Kingdom, Jun. 24, 1982, 8218323

Int. Cl.³ C04B 7/32, 11/12

U.S. Cl. 106—104 18 Claims

1. A cement composition, substantially free from Portland cement, comprising high alumina cement, beta-anhydrite, in a ratio of from 3:7 to 4:1 by weight based on the weight of the high alumina cement and 2.0–8.5% by weight based on the weight of the high alumina cement of at least one form of lime selected from the group consisting of calcium oxide and calcium hydroxide, and which when mixed with water can accommodate high water contents up to 5:1 of water to solid constituents without free water separating out, and hydrates to form a hardened cement containing ettringite.

4,481,038

WATER DISPERSIBLE FATTY ACID BIS-AMIDES

Theodore A. Girard, and Donald H. Foelsch, both of Williamsport, Pa., assignors to Glyco Inc., Williamsport, Pa.

Filed Jun. 29, 1983, Ser. No. 509,018

Int. Cl.³ C08L 91/06

U.S. Cl. 106—271 18 Claims

1. A method of making a readily water dispersible wax composition which comprises the steps of:

(a) melt blending a mixture of an alkyl bis-amide of a saturated fatty acid and a dispersing agent selected from the group consisting of an acid neutralized salt of a N-[2-(2-hydroxyethylamino)ethyl] saturated fatty acid amide or N-[2-(2-aminoethylamino)ethyl] saturated fatty acid amide;

(b) allowing the melted mixture to solidify, and

(c) reducing the solidified mixture to a powder which may be readily dispersed in either hot or cold water.

4,481,039

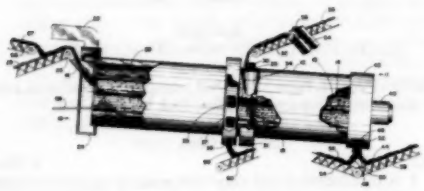
METHOD FOR RECYCLING ASPHALTIC CONCRETE

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Filed Aug. 17, 1981, Ser. No. 293,283

Int. Cl.³ B28C 5/46; C08L 95/00

U.S. Cl. 106—281 R 21 Claims



1. A process for treating asphaltic concrete and aggregate comprising

introducing hot gases of combustion in a first end of an elongated rotating drum,

introducing non-asphalt containing virgin aggregate in a first section of said rotating drum intermediate said first end and a second opposite end of said drum,

introducing used asphaltic concrete composition particles in a second section of said rotating drum at or adjacent said second end of said drum,

gradually heating and advancing said asphaltic concrete along said second section of said drum toward said first end and recovering at least a portion thereof before said asphaltic concrete reaches said first section of said drum, and

gradually heating and advancing said aggregate along said first section of said drum toward said first end and recovering said aggregate from said drum at or adjacent said first end.

4,481,040

PROCESS FOR THE CHEMICAL DISSOLUTION OF OXIDE DEPOSITS

Ian R. Brookes, and Malcolm E. Pick, both of Bristol, England, assignors to Central Electricity Generating Board of Sudbury House, London, England

Filed Jun. 10, 1982, Ser. No. 387,094

Claims priority, application United Kingdom, Jun. 17, 1981, 8118680

Int. Cl.³ B08B 7/04; C23G 1/02

U.S. Cl. 134—3 10 Claims

1. In a process for the chemical dissolution of oxide deposits containing a proportion of chromium and in particular for the chemical decontamination of oxide deposits contaminated with activated species the improvement which consists essentially of contacting the oxide deposits sequentially with

(i) a permanganate salt in acid solution to remove chromium therefrom as hexavalent chromium;

(ii) a reducing agent in acid solution to destroy excess permanganate ions and manganese dioxide formed by reduction of the permanganate; and

(iii) a mixture of a reducing agent and complexing acid to dissolve the residual chromium depleted oxide.

4,481,041

METHOD FOR PRODUCING SCHOTTKY DIODES

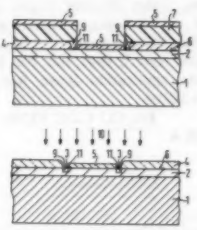
Jörg Müller, Zonreding, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,266

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124572

Int. Cl.³ H01L 21/265

U.S. Cl. 148—1.5 13 Claims



1. Method for manufacturing Schottky diodes which have a doped self-aligning guard ring in the fringe region of the Schottky contact in the semiconductor layer underneath, which comprises applying a first intermediate layer to a semiconductor surface to be implanted, covering the first intermediate layer with a photoresist mask with gaps, etching off the first intermediate layer in the gaps of the photoresist mask down to the semiconductor surface, and also underetching the first intermediate layer underneath the photoresist mask at the edges of the edges of the photoresist mask within the gaps, depositing a second intermediate metal layer on the photoresist mask and in the gaps of the photoresist mask over the entire surfaces, removing the second intermediate layer and photoresist mask except for the second intermediate metal layer in the

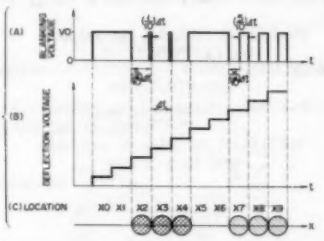
gaps to form an implantation mask with openings therein to permit implantation, from part of the first intermediate layer applied to the semiconductor surface to be implanted and from part of the second intermediate layer applied to the semiconductor surface to be implanted, implanting the guard ring through the openings in the implanting mask in the semiconductor beneath the implanting mask, removing the remainder of the second intermediate layer, thereafter activating the implanted guard ring and subsequently covering the semiconductor surface with a Schottky metal of at least the subregion of the guard ring adjacent to the Schottky contact.

4,481,042

ION IMPLANTATION METHOD

Tadahiro Takigawa, Tokyo, and Isao Sasaki, Chiba, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 8, 1982, Ser. No. 448,048
Claims priority, application Japan, Dec. 18, 1981, 56-20515
Int. Cl.³ H01L *21/70*
U.S. Cl. 148—1.5 **4 Claims**



1. An ion implantation method which uses an ion implantation apparatus comprising an ion gun and an ion optical system for producing a micro ion beam having a spot diameter which is smaller than the size of a region into which ions are to be implanted, a deflecting device for scanning the ion beam on a surface of a semiconductor wafer, a blanking device for blanking the ion beam, and a control device for controlling said devices, said method comprising the step of implanting the ions into at least one of a gate region, source and drain regions, and a field region of a semiconductor device comprising a transistor being formed on said wafer and having a short gate length and width, said method also comprising the steps of:

determining an ion dose for a predetermined region of said wafer as a function of location thereof and storing the data of said ion dose in said control device; and

controlling at least said deflecting device and said blanking device in accordance with said data so as to vary the ON time of the ion beam in accordance with said regions of said semiconductor device, thereby allowing variation of the ion dose.

4,481,043

HEAT TREATMENT OF NICRFE ALLOY TO OPTIMIZE RESISTANCE TO INTERGRANNULAR STRESS CORROSION

Arthur F. Steeves, Schenectady, and Albert E. Bibb, Clifton Park, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1982, Ser. No. 447,727
Int. Cl.³ C22F *1/16*
U.S. Cl. 148—20.3 **15 Claims**

1. A process of fabricating a NiCrFe alloy having a high resistance to stress corrosion cracking comprising:

(a) heating a finished NiCrFe alloy body to a temperature and for a time sufficient to enable the carbon present in said alloy body in the form of carbide deposits to enter into solution in said alloy body;

(b) rapidly cooling said alloy body to room temperature avoiding the precipitation of significant amounts of carbides; and

(c) heating the cooled alloy between the temperature range of about 1100° to 1500° F. for about 10 to 30 hours to maximize the amount of grain boundary relief in said resulting NiCrFe alloy body.

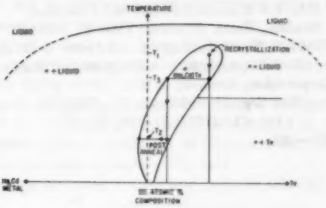
3. The process of claim 1 wherein step (a) further comprises heating said alloy in a nonoxidizing atmosphere.

4,481,044

HIGH-TEMPERATURE HG ANNEAL FOR HGCDTE

Herbert F. Schaake, Denton, and John H. Tregilgas, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 444,903, Nov. 29, 1982, abandoned. This application Mar. 21, 1984, Ser. No. 591,903
Int. Cl.³ C21D *1/74*
U.S. Cl. 148—20.3 **5 Claims**



1. A method for preparation of approximately stoichiometric alloys of (Hg, Cd) Te having a preselected proportion of mercury to cadmium, comprising the steps of:

providing a bulk alloy of mercury, cadmium, and tellurium, said bulk alloy containing an excess of tellurium over said predetermined composition;

annealing said bulk alloy, at an intermediate temperature which is greater than 350° C. and less than the melting point of said bulk alloy, in a saturated atmosphere of mercury, whereby the composition of said bulk alloy is converted to an intermediate alloy having a smaller excess of tellurium; and subsequently

annealing said intermediate alloy at a second temperature, said second temperature being less than 325° C., to compositionally adjust said intermediate alloy to achieve a desired carrier concentration.

4,481,045

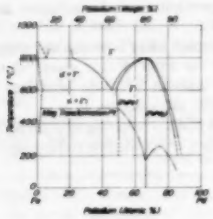
HIGH-COERCIVE-FORCE PERMANENT MAGNET WITH A LARGE MAXIMUM ENERGY PRODUCT AND A METHOD OF PRODUCING THE SAME

Kiyoshi Watanabe, Sendai, Japan, assignor to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

Continuation of Ser. No. 184,980, Sep. 8, 1980, abandoned. This application Apr. 11, 1983, Ser. No. 474,190
Claims priority, application Japan, Oct. 31, 1979, 56-139896
Int. Cl.³ H01F *1/02*
U.S. Cl. 148—101 **4 Claims**

1. A high-coercive-force permanent magnet having a large maximum energy product, consisting of about 28 to 36 atomic % of palladium and the remainder of iron with less than 0.5 atomic % of impurities, wherein the permanent magnet has a crystalline structure with fine grain dispersion of α phase and

γ_1 phase in a matrix, so as to provide a coercive force of higher than 800 Oe (oersted), a residual magnetic flux density of larger



than 8 kG (kilogauss), and a maximum energy product of larger than 2 Mg.Oe (megagauss oersted).

4,481,046

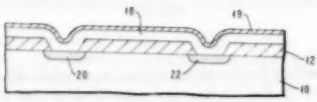
METHOD FOR MAKING DIFFUSIONS INTO A SUBSTRATE AND ELECTRICAL CONNECTIONS THERETO USING SILICON CONTAINING RARE EARTH HEXABORIDE MATERIALS

Dennis P. Bouldin, Essex Junction; Dale P. Hallock, Bristol; Stanley Roberts, South Burlington, and James G. Ryan, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,124

Int. Cl.[3] H01L *21/225, 21/28*

U.S. Cl. 148—188 **14 Claims**



1. A method for diffusing a conductivity determining impurity in a semiconductor substrate and making electrical contact thereto comprising:

depositing a conductive layer of a rare earth hexaboride material containing a predetermined amount of silicon in it over a predetermined surface portion of said substrate;

heating said substrate for a predetermined period of time at a predetermined temperature sufficient to cause boron from said hexaboride material to diffuse into said portion of said substrate so as to modify the conduction characteristics of said portion and to establish an electrical ohmic contact between said conductive layer and said substrate portion.

11. A method for making semiconductor devices wherein a conductive layer is patterned to make electrical contact with predetermined regions of said devices characterized in that said conductive layer is made of a silicon containing rare earth hexaboride material.

4,481,047

HIGH MODULUS SHAFTS

Jules P. Winfree, Jupiter; Herbert A. Chin, West Palm Beach, and Thomas E. O'Connell, North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 22, 1982, Ser. No. 421,673

Int. Cl.[3] C22C *19/03;* C21D *7/00*

U.S. Cl. 148—429 **6 Claims**

1. An article which comprises:

a nickel base alloy containing more than about 30 volume percent of a strengthening phase of the Ni_3X type, said alloy having a moderate to high stacking fault energy, said article having a <111> texture which is at least five times

random along a particular axis and a high modulus of elasticity along the same axis.

4,481,048

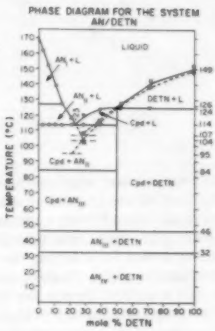
EXPLOSIVE DOUBLE SALTS AND PREPARATION

Howard H. Cady, and Kien-yin Lee, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 3, 1982, Ser. No. 345,460

Int. Cl.[3] C06B *31/32*

U.S. Cl. 149—47 **3 Claims**



1. An explosive composition comprising the equimolar double salt of ammonium nitrate and diethylenetriamine trinitrate, said composition having a density of about 1.61 g/cm^3 and being characterized by an X-ray diffraction pattern as shown in the right-hand column of Table I labeled Compound/115° C.

4,481,049

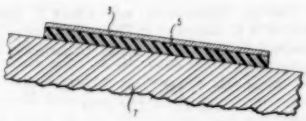
BILEVEL RESIST

Elsa Reichmanis, Westfield, and Gerald Smolinsky, Madison, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 2, 1984, Ser. No. 585,350

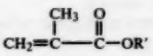
Int. Cl.[3] B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—643 **12 Claims**



1. A process for fabricating a device comprising the steps of forming a radiation sensitive region, on a substrate, patterning at least a portion of said region, and

further processing said substrate characterized in that said region comprises a composition formed by a polymerization process employing a material represented by the formula



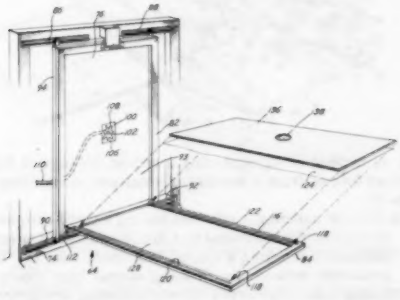
where R′ contains silicon and is chosen so that the T_g of said composition is higher than 50° C., and the silicon weight percentage of said composition is at least 6 percent.

4,481,050

METHOD OF MAKING A THREE-DIMENSIONAL PHOTOGRAPH

Gregory E. Gundlach, and Grayson Marshall, both of 1446 W. Grace, Chicago, Ill. 60613

Filed Sep. 14, 1982, Ser. No. 417,855
Int. Cl.³ B44F *7/00*
U.S. Cl. 156—58 **18 Claims**



1. A method of making a three-dimensional photograph of a subject, said method utilizing a dimensionally stable, unexposed film stock, at least one line rastor having a predetermined periodicity, and a camera including a film mount and a shutter therein, the method comprising:

(a) mounting the dimensionally stable, unexposed film stock and the line rastor having a predetermined periodicity on the film mount such that the film stock is substantially parallel to, and separated by a predetermined distance from, the line rastor;

(b) at least once focusing the camera on the subject, activating the shutter, presenting a different view of the subject with respect to the film stock, and reactivating the shutter again;

(c) developing the film stock to produce an image; and

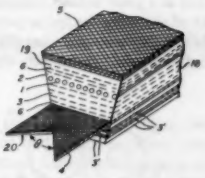
(d) assembling the three-dimensional photograph by arranging the developed film stock and the line rastor such that the film stock is substantially parallel to, and separated by the predetermined distance from, the line rastor whereby a three-dimensional image can be viewed from the side of the line rastor furthest from the developed film stock.

4,481,051

POWER TRANSMISSION BELT MANUFACTURE

Junji Imamura, Kobe, and Kaname Matsumura, Akashi, both of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Division of Ser. No. 306,403, Sep. 28, 1981, Pat. No. 4,432,744.
This application Nov. 4, 1983, Ser. No. 548,638
Claims priority, application Japan, Sep. 26, 1980, 55-138014
Int. Cl.³ F16G *5/00*; B27H *7/22*
U.S. Cl. 156—137 **9 Claims**



1. The method of forming a power transmission belt comprising the steps of:

forming an inner compression section, an outer tension section, and longitudinal tensile cords intermediate said compression and tension section;

providing at least one layer of low thermal contraction fabric as the inner portion of the compression section, said fabric being comprised of yarns formed of a mixture of natural and synthetic fibers in the ratio of approximately 30% to 70%, said fabric being heat-treated to cause said yarns to have a coefficient of thermal contraction of no more than approximately 1%; and

laminating the fabric to said compression section.

4,481,052

METHOD OF MAKING REFRACTORY HARD METAL CONTAINING TILES FOR ALUMINUM CELL CATHODES

William M. Buchta, Baltimore, and Dennis C. Nagle, Catonsville, both of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jan. 28, 1983, Ser. No. 461,893
Int. Cl.³ B32B *31/26*
U.S. Cl. 156—155 **25 Claims**

17. A method for forming an aluminum-wettable cathode surface, which method comprises:

(a) preparing a molding composition of Refractory Hard Material, carbonaceous filler having a particle size less than 100 mesh, and a thermosetting resinous binder system having a char yield greater than 25 percent;

(b) hot pressing said composition to form a cured, rigid element comprising Refractory Hard Material in a carbonaceous matrix;

(c) adhering said rigid element to a carbon cathode block; and

(d) carbonizing said element in situ to form a carbon block having a surface layer comprising Refractory Hard Material in a carbonaceous matrix bonded by amorphous carbon.

4,481,053

METHOD AND APPARATUS FOR SPLICING WEB

Masateru Tokuno, Nishinomiya; Tetsuya Sawada, Kyoto, and Yoshihiro Ishii, Yao, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Filed Sep. 30, 1982, Ser. No. 431,091
Claims priority, application Japan, Sep. 30, 1981, 56-157952
Int. Cl.³ B31F *5/00*; B65H *19/00, 69/02*; G03D *15/04*
U.S. Cl. 156—157 **12 Claims**

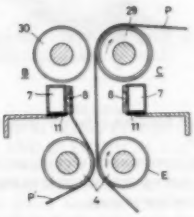
1. A method for splicing the leading end of a standby web to

a running web being continuously supplied from a roll, comprising the steps of:

holding the leading end of the standby web adjacent a splice point at which the webs are to be spliced together and in position for splicing, the leading end having adhesive means applied to one surface of the leading end of the standby web along the leading edge thereof;

stopping the running web by gripping it between two rolls, at least one of which has a brake which is applied to brake said one roll at a point behind, relative to the direction of movement of the web, the splice point;

clamping the running web at a point ahead of, relative to the direction of movement of the web, the splice point so that



the web is held taut between the point ahead and the point behind;

cutting the taut running web between said gripping and clamping points and at a position corresponding substantially exactly to the end of the splice which is toward the clamping point;

then splicing the leading end of the standby web to the running web by pressing the cut end portion of the running web including the portion immediately adjacent the cut against the held leading end of the standby web with said adhesive means therebetween; and

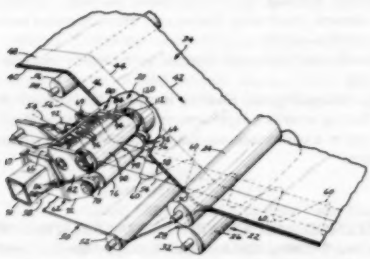
releasing the braked one roll for releasing the spliced web from the gripping and clamping thereof to permit it to start running.

4,481,054

METHOD OF FORMING REINFORCING NETWORK

Victor H. Clausen, and Charles E. Asbury, both of Vancouver, Wash., assignors to H. B. Fuller Company, St. Paul, Minn.

Division of Ser. No. 322,893, Nov. 19, 1981, Pat. No. 4,451,515.
This application Dec. 2, 1983, Ser. No. 557,646
Int. Cl.³ B31F *1/20*; B32B *5/02, 29/02*
U.S. Cl. 156—177 **2 Claims**



1. A method of forming a reinforced corrugated board pull sheet, comprising the steps of:

(a) feeding a web having a substrate with opposite sides, corrugated flutes carried on one of said sides, and a score extending generally in the direction of feed, into a nip formed by two rollers of a double backer compression device;

(b) concurrently feeding a liner sheet having a score extending generally in the direction of feed into said nip to engage said side of said web carrying said flutes so that said scores are superimposed;

(c) forming a reinforcing filament network having a pair of spaced, generally linearly extending filaments and a generally sinusoidal filament extending in a direction in which said generally linearly extending filaments extend and sinuating thereacross, said sinusoidal filament being bonded to said pair of linearly extending filaments and said network bonded to said corrugated flutes and said liner; and

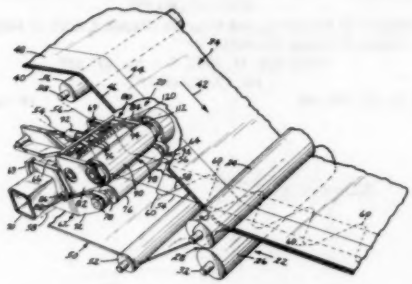
(d) feeding said network into said nip and between said liner sheet and said flutes with said generally linearly extending filaments straddling said superimposed scores.

4,481,055

METHOD OF FORMING REINFORCING NETWORK

Victor H. Clausen, and Charles E. Asbury, both of Vancouver, Wash., assignors to H. B. Fuller Company, Saint Paul, Minn.

Division of Ser. No. 322,893, Nov. 19, 1981, Pat. No. 4,451,515.
This application Dec. 2, 1983, Ser. No. 557,647
Int. Cl.³ B31F *1/20*; B32B *5/02, 29/02*
U.S. Cl. 156—177 **4 Claims**



1. A method of strengthening a scored corrugated board product formed from a plurality of substrates, comprising the steps of:

(a) prior to adhering a substrate having a score comprising corrugated flutes adhered to a first liner sheet to a second substrate comprising a second liner sheet, with the flutes positioned between the first and second liner sheets, inserting a pair of generally linearly extending strengthening filaments, one on either side of the score, between the substrates, with the filaments spaced from, and running generally parallel to, the score; and

(b) prior to adhering the two adjacent substrates together, inserting a serpenting filament, sinuating generally sinusoidally across, and intersecting, the pair of generally linearly extending strengthening filaments, between the substrates, the serpentine filament being bonded to the pair of strengthening filaments.

4,481,056

PROCESS FOR CONTINUOUS PRODUCTION OF SHAPED BODIES OF SYNTHETIC RESIN REINFORCED WITH AXIALLY PARALLEL FIBERS

Martin Kuhl, Selb, Fed. Rep. of Germany, assignor to Rosenthal Technik AG, Selb, Fed. Rep. of Germany

Filed May 11, 1982, Ser. No. 376,952
Claims priority, application European Pat. Off., Jul. 24, 1981, EP81105857.7
Int. Cl.³ B32B *5/02*; G32B *5/12*
U.S. Cl. 156—180 **10 Claims**

1. A process for continuous production of shaped bodies of

synthetic resin reinforced with axially parallel fibers substantially free of internal discharge promoting internal inhomogeneities and suitable for use as a high voltge electrical insulator comprising the steps of:

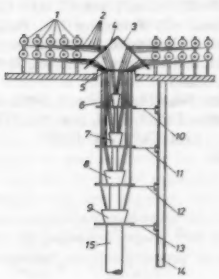
drawing a plurality of individual fibers substantially vertically through spaced apertures in a perforated guide plate;

drawing a first portion of said fibers vertically through a first means for impregnating fibers with a synthetic resin and impregnating said first fiber portion with a synthetic resin therein; said first impregnating means being heated to a uniform elevated temperature lying in the range from 30° to 180° C.;

drawing the resin impregnated fibers vertically through a first nozzle to form the resin impregnated fiber portion to a desired first shape in which the resin is still liquid at the surface thereof;

drawing the shaped body from the preceding nozzle and an additional portion of said fibers vertically through a further resin impregnating means heated to the same temperature as said first impregnating means and impregnating said additional fiber portion with a synthetic resin therein;

drawing the shape and the resin impregnated additional fibers from said further impregnating means through a further nozzle to form the shaped body and the resin impregnated additional fiber portion to a further desired shape in which the resin is still liquid at the surface thereof;



repeating the preceding two steps a selected number of times,

continuously supplying preheated resin to each impregnating means; and

drawing the desired shape from the final nozzle vertically through a hardening zone disposed immediately following the final nozzle and subjecting the shape to a distributed flow of hot air maintained at the same temperature as the resin impregnating means such that a uniform temperature corresponding to the temperature of the impregnating means is maintained throughout the entire vertical length of said hardening zone, and hardening the final shape in said hardening zone;

said perforated guide plate, said resin impregnating means, said nozzles and said hardening zone being disposed in vertical arrangement;

whereby the final fiber-reinforced shaped body is essentially free of bubbles, cracks and cavities which could promote internal discharge and has a substantially regular fiber distribution throughout with the reinforcing fibers being oriented axially parallel to each other and to the shaped body, and the shaped body is formed as a series of individually impregnated and successively assembled and hardened solid, cross-sectional segments beginning with a central core and proceeding to the outer surface.

4,481,057

CUTTING DEVICE AND METHOD OF MANUFACTURE

Robert W. Beard, Placerville, Calif., assignor to Oximetrix, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 201,603, Oct. 28, 1980,. This application Jun. 30, 1981, Ser. No. 278,955

Int. Cl.³ B32B *3/04*

U.S. Cl. 156—216 **12 Claims**

1. A method for manufacturing a cutting instrument having a hollow instrument body with proximal and distal ends, a blade body with a shank section and a cutting edge section, and a heater assembly with proximal and distal portions integrally fabricated from an electrically-conductive strip material, said method comprising the steps of:

passing the distal portion of the heater assembly through the hollow instrument body;

wrapping the distal portion of the heater assembly around the distal end of the hollow instrument body to establish an electrical contact;

securing the shank section of the blade body to the proximal end of the hollow instrument body such that the cutting edge section of the blade body extends from the proximal end of the hollow instrument body; and

laminating the proximal portion of the heater assembly to the blade body such that the heater assembly is electrically insulated from but in good thermal communication with the blade body and such that direct electrical connection is maintained between said electrical contact established at the distal end of the hollow instrument body and the proximal portion of the heater assembly.

4,481,058

HEAT-SEALABLE LAMINAR THERMOPLASTIC FILMS

Hee C. Park, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 248,937, Mar. 30, 1981, Pat. No. 4,367,112, which is a continuation-in-part of Ser. No. 99,171, Nov. 30, 1979, abandoned. This application Aug. 30, 1982, Ser. No. 413,186

Int. Cl.³ B29G *19/00*

U.S. Cl. 156—244.24 **2 Claims**

1. A method for heat sealing a film combination comprising applying to the surface of a biaxially oriented film of stereoregular polypropylene a coating consisting essentially of a copolymer of ethylene and methyl acrylate containing from about 6% up to about 30% by weight of methacrylate; placing the coated film into contact with another so-coated polypropylene film surface wherein the contacting surfaces are both coated, and heat sealing the combination at a temperature below about 270° F.

4,481,059

WINDOW PANEL REMOVAL METHOD

Mark A. Steck, Miamisburg, Ohio, assignor to Steck Manufacturing Co., Inc., Dayton, Ohio

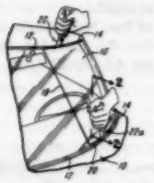
Division of Ser. No. 260,062, May 4, 1981, Pat. No. 4,417,398. This application Jan. 3, 1983, Ser. No. 456,591

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—254 **1 Claim**

1. The method of removing a window panel secured by an adhesive compound to channel means generally surrounding the margins of said panel comprising the steps of extending a wire through the compound at opposite margins of said panel and across one face of said panel between said opposite mar-

gins and progressively cutting said compound by reciprocating the ends of said wire in planes generally parallel to the major



faces of said panel and by the same reciprocation in directions generally parallel to the free edges of said panel.

4,481,060

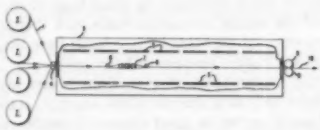
PROCESS FOR LAMINATING ARAMID WATERLEAVES

Edwin H. Hayes, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1980, Ser. No. 214,964

Int. Cl.[3] **C09J** *5/00*

U.S. Cl. 156—309.9 **5 Claims**



1. Process for combining layers of waterleaves comprised of aramid fibrids and aramid floc into a unitary sheet structure whereby two or more of said layers are (1) brought together in closely spaced relationship while being forwarded under low tension through a heating zone, (2) heated, (3) separated by mechanical means, (4) purged by a stream of dry air to expel moisture-laden air from between the layers in a transverse direction while preventing moisture-laden air from moving along with the layers in the downstream direction, (5) brought together again and further heated and (6) compacted under heat and pressure.

4,481,061

ETCHING DEPTH MONITOR

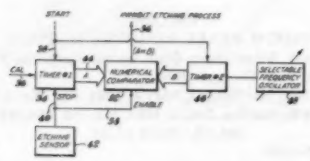
Alexander Ross, Ayr, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 327,540, Dec. 4, 1981, abandoned. This application Jun. 10, 1983, Ser. No. 490,013

Claims priority, application United Kingdom, Dec. 5, 1980, 8039048

Int. Cl.[3] **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—345 **15 Claims**



1. A controller for controlling a chemical etching process, said controller comprising:

a first timer, having a start input for starting at the commencement of a test etching process and having a stop input for stopping at the termination of said test etching to measure and provide an output indicative of the amount of time required to etch through a predetermined thickness of metal;

a second timer, having a start input for starting at the commencement of a main etching process to measure and provide an output indicative of the amount of time that said main etching process has been in progress;

a comparator, coupled to receive and compare said outputs of said first and second timers to terminate said main etching process whenever said amount of time measured by said second timer is in a predetermined, selectable ratio to said amount of time measured by said first timer, said ratio being the proportion of said depth of metal to be etched and said predetermined thickness of metal;

whereby said main etching process is controllable to etch a depth of metal in the same proportion to said predetermined thickness as said ratio.

4,481,062

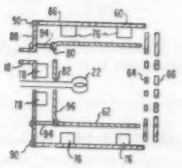
ELECTRON BOMBARDMENT ION SOURCES

Harold R. Kaufman, 401 Spinnaker La., Fort Collins, Colo. 80525; Raymond S. Robinson, 2612 Bradbury Ct., Fort Collins, Colo. 80521, and William E. Hughes, 7845 Heritage Dr., Annandale, Va. 22003

Continuation of Ser. No. 414,062, Sep. 2, 1982, abandoned. This application Feb. 7, 1984, Ser. No. 577,833

Int. Cl.[3] **C23C** *15/00*

U.S. Cl. 156—345 **6 Claims**



1. In an ion source which includes:

means defining a chamber of conductive material for containing an ionizable gas within said chamber;

an anode disposed within said chamber;

an electron-emissive cathode disposed within said chamber;

means for effecting electron emission at a sufficient velocity to ionize said gas;

means for accelerating ions out of said chamber;

and means for establishing a magnetic field within such chamber to increase the efficiency of ionization of said gas by said electrons;

the improvement comprising:

said anode being conductive and of non-magnetic material and defining an essentially-continuous and smooth surface including substantially all of the volume within which said ionization occurs except for the exit for accelerated ions out of said chamber;

means for mounting said anode within and electrically insulating said anode from said chamber;

and said establishing means being located exteriorly of said anode.

4,481,063

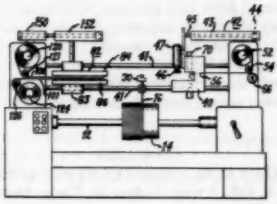
APPARATUS FOR APPLYING INSULATION TO A COIL LEAD

James W. Morton, Hickory, N.C., assignor to General Electric Company, King of Prussia, Pa.

Continuation of Ser. No. 203,200, Nov. 30, 1980, abandoned, which is a division of Ser. No. 34,793, Apr. 30, 1979, Pat. No. 4,262,413. This application Feb. 7, 1983, Ser. No. 463,427

Int. Cl.[3] **H01F** *41/10;* **H01R** *43/00*

U.S. Cl. 156—349 **3 Claims**



1. An insulation applicator for applying electrical insulation to a thin conductive strap that is attached to wire that is being wound into an electrical coil, comprising:

a. a pair of applicator segments between which is located a feed passage through which two strips of insulation are fed, at least one of said two strips having on its face confronting the other strip normally non-sticky adhesive that can be rendered sticky by heating said adhesive.

b. means for moving said segments transversely of said wire from a first position where the forward ends of said segments are located at one side of said wire to a second position where: (i) the forward ends of said segments are located at the opposite side of said wire and (ii) said conductive strap is positioned in said feed passage,

c. holding means on said segments for releasably holding said strips respectively to said segments while the strips extend through said feed passage, said holding means acting to releasably hold apart the forward ends of said strips when the segments are in said first position and while the segments are being moved to said second position,

d. resilient means adapted when activated to force said strips together,

e. means operable when said segments have been moved into said second position for activating said resilient means and for heating said strips thereby then forcing said strips together about said conductive strap and rendering said adhesive sticky through heat so that the strips are then bonded together,

f. means operable after said strips are bonded together for inactivating said holding means to release said strips from said segments,

g. means for returning said segments toward said first position after said strips have been released, and

h. means for cutting off said strips at a location at said one side of said wire after said strips have been bonded together.

4,481,064

DUAL ROTARY HEAD BANDING MACHINE

Gerald D. Westlund, 12164 Mississippi Dr., and Gerald A. Westlund, 13430 Yorktown La., both of Champlin, Minn. 55316

Filed Dec. 15, 1982, Ser. No. 450,065

Int. Cl.[3] **B32B** *31/02;* **B65B** *13/00*

U.S. Cl. 156—351 **13 Claims**

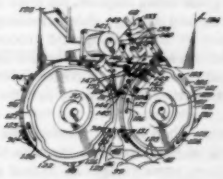
1. A dual head banding apparatus applying a tubular band to a container, comprising:

(a) conveying means disposed along a longitudinal axis of said apparatus for moving containers from a first location of said machine to a second location,

(b) at least one plastic strip feeding mechanism feeding a tubular flat folded heat-shrinkable strip above said conveying means;

(c) a cutting device for cutting the plastic strip into a plurality of labels of predetermined length and diameter while in said flat-folded condition, said feeding mechanism containing the labels until retrieved;

(d) a pair of wheels revolving about axes disposed substantially parallel to, above and transversely disposed from, said longitudinal axis and having a plurality of vacuum heads secured thereto, said vacuum heads disposed in



groups around the periphery of each of said wheels for retrieving said plurality of labels from said tubular strip feeding mechanism and engaging the same on both sides until depositing the same over a container;

(e) a source of vacuum;

(f) a pair of manifolds each having a first portion communicating with said revolving wheels and vacuum heads and having a second fixed portion constructed and arranged to communicate with said first portion and at least said source of vacuum, said manifolds connecting said source of vacuum to said plurality of vacuum heads; and

(g) a synchronous drive mechanism connecting said conveying means to said pair of wheels to ensure a proper rate of movement of said containers under said wheel.

4,481,065

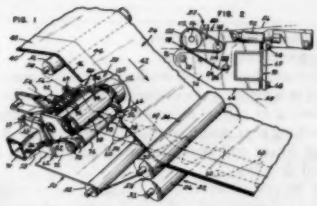
NETWORK REINFORCING FORMING APPARATUS

Victor H. Clausen, and Charles E. Asbury, both of Vancouver, Wash., assignors to H. B. Fuller Company, St. Paul, Minn.

Division of Ser. No. 322,893, Nov. 19, 1981, Pat. No. 4,451,515. This application Dec. 2, 1983, Ser. No. 557,613

Int. Cl.[3] **B31F** *1/20;* **B32B** *5/02, 29/02*

U.S. Cl. 156—440 **5 Claims**



1. A device for forming a filament reinforcing network for strengthening cardboard and paper products, comprising:

(a) a pair of pressure rollers having a first nip therebetween, said pressure rollers having generally parallel axes about which they rotate;

(b) means for feeding a pair of generally parallel and gener-

ally linearly extending filaments into said first nip and through said rollers; and

(c) means for feeding a third filament, impregnated with a hot melt adhesive having a measure of cold flowability when subjected to pressure, into said first nip and through said rollers, and for sinuating said third filament across and intersecting said pair of filaments, said third filament feeding means comprising:

(i) a circularly cylindrical cam mounted for rotation about an axis generally parallel to said axes of said pressure rollers, said cam having an outer surface and an endless groove formed in said surface, said groove running both circumferentially and axially;

(ii) a third filament guide, through which said third filament runs, mounted closely proximate said first nip on a side thereof from which said filaments are fed thereinto, said guide being disposed for axial movement along said first nip and having a shoe extending therefrom into said groove for travel along said groove; and

(iii) wherein said groove is formed in said surface so that as said cam is made to rotate about its axis, said guide will be driven reciprocally in opposite axial directions; and

(d) wherein, when intersections of said third filament with said pair of filaments pass through the first nip between said rollers, pressure applied to said intersections by said rollers causes flow of said hot melt adhesive and bonding of said filaments at said intersections.

4,481,066

SINGLE FACER

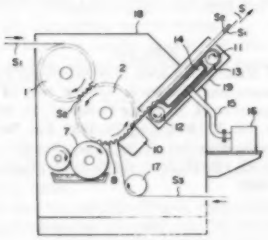
Tadashi Hirakawa, and Hiroaki Sasashige, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 374,332, May 3, 1982, abandoned. This application Mar. 1, 1984, Ser. No. 585,138

Claims priority, application Japan, May 8, 1981, 56-690044

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—472 **5 Claims**



1. A single facer comprising:

an upper corrugating roll;

a lower corrugating roll meshed with said upper corrugating roll in a meshing area lying on a feed path for a first sheet moving in a feed direction which is corrugated in said meshing area, said feed path extending around a portion of said lower roll downstream of said meshig area in said feed direction;

drive means connected to at least one of said upper and lower corrugating rolls for driving said corrugating rolls to move the first sheet in the feed direction along said feed path;

pasting means lying on said feed path downstream of said meshing area and associated with said lower roll for applying paste to the first sheet as it moves on said lower roll;

a pressure member for pressing a second sheet to the first sheet after it receives paste from said pasting means, said pressure member lying on said feed path and associated with said lower roll downstream of said meshing area in a pressing area;

feed means for feeding the second sheet to said pressing area for producing a single faced corrugated sheet having the second sheet facing said pressure member; and

a suction conveyor lying on said feed path and spaced downstream of said pressing area for engaging the corrugated single faced sheet on a surface of the second sheet by suction and conveying the corrugated sheet in the feed direction along said feed path and downstream of said pressing area, said suction conveyor being separate from and spaced from said pressure member and comprising a plurality of belts for engaging the second sheet by suction and drive means for driving said belts in the feed direction and along said feed path at a speed at least equal to and at most only slightly greater than a circumferential speed of said lower corrugated roll moving in said feed path.

4,481,067

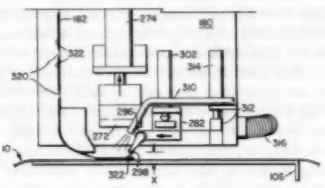
APPARATUS FOR ADHESIVE STRIP APPLICATION

Joseph W. A. Off, Irving; Judson H. Early, Dallas; Daniel K. Roady, Dallas, and Theodore B. Thayer, Dallas, all of Tex., assignors to Haggar Company, Dallas, Tex.

Continuation-in-part of Ser. No. 170,750, Jul. 21, 1980, Pat. No. 4,371,074. This application Aug. 16, 1982, Ser. No. 408,640

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—541 **15 Claims**



4. An apparatus for applying an adhesive strip to a workpiece comprising:

a source of adhesive ribbon having an adhesive layer and a backing layer;

a quantity of said ribbon disposed in said apparatus along an input path, said input path including means for applying discrete strips of said adhesive layer to the workpiece; and

means for removing said backing layer from individual applied strips fo adhesive which includes a reciprocally mounter roller for movement parallel to the workpiece proximate the applied discrete strips and interposed between said backing layer and said strips of adhesive for separating said backing layer from said attached strips of adhesive.

4,481,068

SELECTIVE SPOT GLUE SYSTEM

Jarold L. Richey, Dayton, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Dec. 20, 1983, Ser. No. 563,331

Int. Cl.³ D05C *1/16*

U.S. Cl. 156—548 **6 Claims**

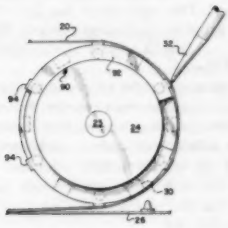
1. In a machine for collating multiple flexible webs,

including a power driven conveyor on which the webs are assembled,

a plurality of wheel members arranged to guide individual webs onto the conveyor,

glue nozzles mounted opposite certain of the wheel members and operative to deposit glue onto a selected area of a web passing around the associated wheel member; the improvement comprising

a spot glueing attachment for the wheel members including a pair of curved side parts spaced apart to fit against opposite sides of the wheel member and having an outer diameter approximately equal to the diameter of the wheel,



cross bars connecting said side parts and designed to extend across the periphery of the wheel,

and means for securing said attachment to a selected wheel member.

4,481,069

HYDROTHERMAL CRYSTAL GROWING PROCESS

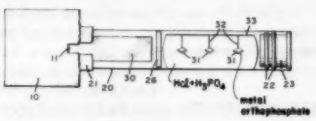
Bruce H. Chai, Bridgewater; Ernest Buehler, Chatham, and John J. Flynn, Millington, all of N.J., assignors to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 230,075, Jan. 30, 1981, Pat. No. 4,382,840. This application Jan. 6, 1982, Ser. No. 337,231

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.[3] **C30B** *7/10*

U.S. Cl. 156—623 R **25 Claims**



1. A process for growing crystals of a metal orthophosphate selected from the group consisting of alpha-aluminum orthophosphate and alpha-gallium orthophosphate, comprising the steps of:

(a) suspending a seed crystal of the metal orthophosphate in a first chamber of a substantially horizontally-oriented pressure vessel, and first chamber being partitioned from at least one additional chamber so that a temperature gradient can be maintained and fluid can flow between the chambers,

(b) introducing into a second chamber of the vessel a quantity of nutrient crystals of the metal orthophosphate, and then, sequentially,

(c) partially filling the vessel with a mixture of hydrochloric acid and phosphoric acid,

(d) sealing the vessel,

(e) heating the contents of the vessel to achieve a seed crystal temperature in the range from about 135° C. to 210° C. and a nutrient temperature from about 5° C. to 30° C. lower,

(f) maintaining the temperatures in the vessel while rocking the vessel about a horizontal axis to raise first one chamber of the vessel and then another, whereby the seed crystal grows from an acid solution of the metal orthophosphate, and

(g) recovering the crystal product.

4,481,070

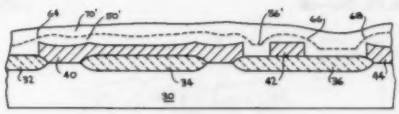
DOUBLE PLANARIZATION PROCESS FOR MULTILAYER METALLIZATION OF INTEGRATED CIRCUIT STRUCTURES

Mammen Thomas, San Jose, and Linda J. Koyama, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 4, 1984, Ser. No. 596,745

Int. Cl.[3] **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **16 Claims**



1. An improved process for the planarization of an integrated circuit structure comprises:

(a) applying over a metallization layer, having one or more openings therein, a layer of insulation sufficiently thin to avoid formation of voids in the portion of said insulation deposited in the openings in said metallization layer;

(b) smoothing said insulation layer by removing the high portions of said insulation;

(c) applying a further layer of insulation over said first insulation layer; and

(d) smoothing said further layer of insulation by removing the high portions of said insulation;

whereby the resultant smoothed insulation surface will be substantially planar and substantially void-free.

4,481,071

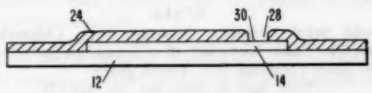
PROCESS OF LIFT OFF OF MATERIAL

Nathaniel C. Anderson, Pine Island; Robert B. Chesnut, and Larry E. Daby, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,871

Int. Cl.[3] **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—656 **7 Claims**



1. The process for fabrication of thin film magnetic transducer gaps by lift-off basic process comprising:

a. sputter depositing a thin copper metalization layer;

b. applying a non-conductive mask to predetermined selected portions of a surface of said metalization layers;

c. plating copper on unmasked surfaces to a thickness at least twice the thickness of the desired gap and removing said non-conductive mask;

d. sputter etching for removing said exposed metalization layer;

e. sputter deposition of dielectric material; and,

f. etching away said plated copper and remaining metalization layer material with a solution of ammonium persulfate.

4,481,072

METHOD FOR RECOVERY OF WASTEWATER RESIDUES

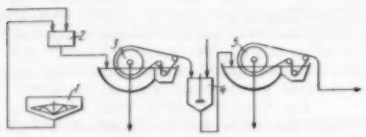
Vladimir P. Grudinin, Amursk; Boris M. Bukhteev, and Tatyana V. Dergunova, both of Leningrad, all of U.S.S.R., assignors to Vsesojuznoe Nauchno-Proizvodstven Noe Obiedinenie Tsellj ulozno-Bumazhnoi Promyshlennosti, Leningrad, U.S.S.R.

Continuation of Ser. No. 209,785, Nov. 24, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 410,162

Claims priority, application U.S.S.R., Dec. 3, 1979, 2847164

Int. Cl.[3] D21C *11/04*

U.S. Cl. 162—16 2 Claims



1. A method for recovery of wastewater residues of mixed domestic sewage and wastewater from a sulfate pulp enterprise, said sewage and waste comprising active sludge biomass, fibers and bark, wherein the sewage and wastewater are treated with an alkaline solution having a concentration of 5–80 g/l calculated as Na_2O at a temperature of 20 to 70 C., said treatment hydrolyzing at least a portion of the active sludge biomass to form amino-derivatives therefrom, and the resulting reaction mixture is dewatered, the alkali filtrate so obtained containing active sludge hydrolysis products being used to dissolve a melt in the course of preparation of alkali pulping liquor, and the solid product of the dewatering being added, in an amount up to 40% by mass to a fibrous mass composition for the manufacture of cardboard or wood-fiber board.

4,481,073

PROCESS FOR REMOVING ANTHRAQUINONE TYPE SCALE

Kazuaki Sakai, Fujisawa; Tuneyasu Sato, Chigasaki, and Kazuhiko Chiba, Kawasaki, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Nov. 19, 1981, Ser. No. 323,131

Claims priority, application Japan, Dec. 1, 1980, 55-169297; Dec. 15, 1980, 55-175745

Int. Cl.[3] D21C *11/10;* C23G *1/14*

U.S. Cl. 162—30.1 9 Claims

1. A process for removing an anthraquinone type scale formed on condenser surfaces upon condensation of a vapor evaporated from a black liquor, said black liquor being obtained by separating pulp from a digested mixture of lignocelluloses containing an anthraquinone type digesting assistant, the process comprising: contacting said surfaces having anthraquinone scales adhered thereto with a heated aqueous solution of a base and a reducing agent selected from the group consisting of hydrosulfites, zinc, sodium borohydride, saccharides, amines and aldehydes, wherein said base and said reducing agent are used in the ratios 0.6 to 5.0 by weight and 0.5 to 10.0 of the stoichiometric amount, respectively, based on the anthraquinone component in the scale.

4,481,074

PROCESS FOR THE PREPARATION OF A SODIUM SULPHITE CONTAINING LIQUOR

Ismo Reilama; Arto Vainiotalo, and Ilimo Yrjälä, all of Rauma, Finland, assignors to Rauma-Rapola Oy, Rauma, Finland

Continuation-in-part of Ser. No. 133,420, Mar. 24, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,867

Claims priority, application Finland, Mar. 27, 1979, 791015

Int. Cl.[3] C01B *17/62;* D21C *11/02*

U.S. Cl. 162—36 7 Claims

1. In a process for the preparation of a sodium sulphite-containing solution wherein a reaction between sodium bisulphite and a carbonate compound selected from the group consisting of sodium bicarbonate, sodium carbonate and mixtures thereof is carried out by contacting solutions containing said compounds with each other, and wherein carbon dioxide is liberated as a reaction product, said reaction being further characterized in that the

contact between the solutions and gas phase takes place in a reaction vessel comprising at least one layer of tower packings wherein the tower packings have a surface area of from 5 to 20 square meters per kilomole of sodium carbonate and sodium bicarbonate fed to the reaction vessel in an hour,

the reaction temperature ranges from 40° to 110° C.,

the reaction vessel is pressurized via the formed carbon dioxide so that the pressure therein exceeds atmospheric pressure by from 1 to 5 bars,

essentially all of the carbon dioxide liberated as a reaction product is recovered under super atmospheric pressure and is used for the pressurized carbonation of green liquor or sodium carbonate without any additional compressing of the gas,

the pH of the solution recovered from the bottom portion of the reaction vessel is from 6 to 8,

the total sodium ion concentration in the feed solutions containing said carbonate compound is from 3 to 6 moles/liter,

the total sodium ion concentration in the feed solution containing sodium bisulphite is from 2.5 to 5 moles/liter with the pH thereof being from 2 to 5.

4,481,075

SHEET PRODUCTS AND PREPARATION PROCESS THEREOF

Christian Dailly, Neuilly Plaisance, and Daniel Gomez, Mimizan, both of France, assignors to Arjomari-Prioux, Paris, France

Continuation of Ser. No. 253,512, filed as PCT FR 80/00115, Jul. 8, 1980, published as WO 81/00268, Feb. 5, 1981 § 102(e) dated Mar. 10, 1981, abandoned. This application Jan. 10, 1983, Ser. N. 459,380

Claims priority, application France, Jul. 10, 1979, 79 17910

Int. Cl.[3] D21H *5/18*

U.S. Cl. 162—145 8 Claims

1. A sheet adapted to be subjected to heat treatment sufficient to cause melting of the thermoplastic material contained therein comprising:

a basic mixture consisting essentially of 5 to 30% by weight of cellulosic fibers refined to a Shopper-Riegler degree of between 15 and 65 with 0 to 30 parts by weight of the cellulosic fibers being replaced with non-cellulosic fibers, and 95 to 70% by weight of a powder of thermoplastic material; said mixture having from 0.02 to 10 parts by weight for 100 parts by weight of said basic mixture, of at least one flocculating agent consisting of a water soluble multivalent salt or a water soluble organic polymer having flocculating activity; and from 2.0 to 30 parts by weight, for 100 parts by weight of said basic mixtures, of at least one binding agent selected from polymer latexes and starches.

2. The sheet of claim 1 wherein said non-cellulosic fibers are glass fibers.

4,481,076

REDISPERSIBLE MICROFIBRILLATED CELLULOSE

Franklin W. Herrick, Shelton, Wash., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,555
Int. Cl.³ D21H 3/00
U.S. Cl. 162—158 20 Claims

1. Dry microfibrillated cellulose containing in admixture a compound capable of substantially inhibiting hydrogen bonding between the fibrils in the cellulose characterized by having a viscosity when redispersed in water of at least 50% of the viscosity of an equivalent concentration of said microfibrillated cellulose dispersed in water prior to drying, said microfibrillated cellulose having been prepared by repeated passage of a liquid suspesion of cellulose fibers through a high pressure homogenizer having a small diameter orifice in which said suspension is subjected to a pressure drop of at least 3000 psi followed by a high velocity decelerating impact against a solid surface, said microfibrillated cellulose further characterized by having a settling volume after 60 minutes in a 0.5% by weight suspension in water of greater than 60%.

4,481,077

PROCESS FOR PREPARING MICROFIBRILLATED CELLULOSE

Franklin W. Herrick, Shelton, Wash., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,556
Int. Cl.³ D21H 3/00
U.S. Cl. 162—158 8 Claims

1. A process of preparing microfibrillated cellulose comprising adding to never-dried cellulosic pulp an additive compound capable of substantially inhibiting hydrogen bonding of the fibrils in the cellulose, said additive compound being nonreactive with said cellulose and not having substantial volatility during drying, drying said cellulosic pulp and additive compound to a moisture content no greater than 15%, adding a liquid to said dried cellulosic pulp and additive compound to form a liquid suspension thereof and passing said liquid suspension through a high pressure homogenizer having a small diameter orifice in which said suspension is subjected to a pressure drop of at least 3000 psi followed by a high velocity decelerating impact against a solid surface to form a suspension of microfibrillated cellulose.

4,481,078

PROCEDURE AND MEANS FOR CHANGING A PRESS FABRIC IN THE PRESS SECTION OF A PAPER MACHINE

Eero Niemi, Jyväskylä, Finland, assignor to Valmet Oy, Finland

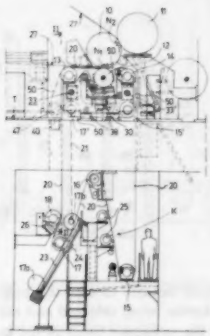
PCT No. PCT/FI81/00073, § 371 Date May 6, 1982, § 102(e) Date May 6, 1982, PCT Pub. No. WO82/01202, PCT Pub. Date Apr. 15, 1982
PCT Filed Sep. 22, 1981, Ser. No. 377,269
Claims priority, application Finland, Sep. 25, 1980, 803020
Int. Cl.³ D21F 1/32, 3/02, 7/08
U.S. Cl. 162—199 4 Claims

1. Method for changing a felt which forms a part of a press section of a paper machine, said press section including a felt having a run which passes above and below a certain level of said machine, over a lower press roll above said certain level, and over at least one first guide roll substantially adjacent to said lower press roll, said lower press roll and said at least one first guide roll being rotatably supported by at least one cantilever beam, said cantilever beam supported by at least one insert, wherein said insert is removed during the felt changing operation, the improvement comprising the steps of

lifting both ends of at least one second guide roll disposed below said certain level, to an upper position substantially adjacent to said at least one cantilever beam,

maintaining said lower press roll substantially in position when said at least one second guide roll is lifted,

inserting a new felt around said lower press roll and around said first and second guide rolls through a space created by removing said at least one insert,



lowering said at least one second guide roll to its original position, and

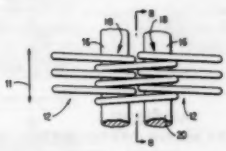
re-introducing said at least one insert.

4,481,079

SPIRAL FABRIC PAPERMAKERS FELT FORMED FROM NON-CIRCULAR CROSS SECTION YARNS

Donald Dawes, Waycross, Ga., assignor to Scapa Inc., Waycross, Ga.

Continuation-in-part of Ser. No. 273,031, Jun. 12, 1981, Pat. No. 4,395,308. This application Sep. 24, 1982, Ser. No. 423,468
The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.
Int. Cl.³ D21F 1/10; D04H 3/02
U.S. Cl. 162—348 14 Claims



1. A papermakers fabric having an upper surface and a lower surface, said fabric comprising:

a plurality of hinge yarns, all of said hinge yarns extending in a common direction;

a plurality of spiral coils disposed in a common plane in a side-by-side relationship, each of said coils extending in said common direction, adjacent coils of said spirals intermeshed and held together in intermeshing relationship by at least one of said hinge yarns, said spiral coils formed from yarns having a non-circular cross-section;

each of said hinge yarns and each of said coil yarns having uniform cross sections throughout their respective lengths and being substantially free of surface discontinuities.

4,481,080

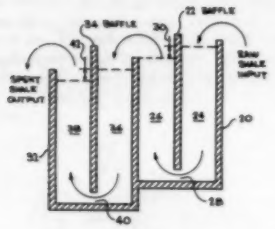
STAGED FLUIDIZED BED

Richard G. Mallon, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 13, 1983, Ser. No. 494,236
Int. Cl.³ B01J 8/26, 8/32; C10B 49/22, 53/06
U.S. Cl. 201—31 3 Claims

1. A method for substantially equalizing the residence times

of large and small particles in a fluidized bed comprising passing the particles through a first fluidized bed column from top to bottom and passing the particles through a second fluidized



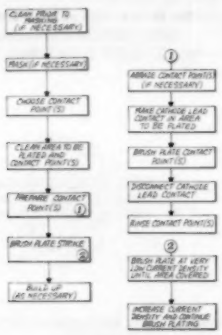
bed column from bottom to top, the heights of the fluidized beds in the columns being selected and maintained to substantially equalize the residence times of the large and small particles in the pair of columns.

4,481,081

METHOD FOR BRUSH PLATING CONDUCTIVE PLASTICS

Roark M. Doubt, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1983, Ser. No. 537,723
Int. Cl.³ C25D *5/02, 5/06*
U.S. Cl. 204—15 **10 Claims**


CLEAN PRIOR TO MASKING (IF NECESSARY)
MASK (IF NECESSARY)
CHOOSE CONTACT POINT (S)
CLEAN AREA TO BE PLATED AND CONTACT POINT(S)
PREPARE CONTACT POINT(S) 1
BRUSH PLATE STRIKE 2
BUILD UP (AS NECESSARY)
1
ABRADE CONTACT POINT(S) (IF NECESSARY)
MAKE CATHODE LEAD CONTACT IN AREA TO BE PLATED
BRUSH PLATE CONTACT POINT(S)
DISCONNECT CATHODE LEAD CONTACT
RINSE CONTACT POINT(S)
2
BRUSH PLATE AT VERY LOW CURRENT DENSITY UNTIL AREA COVERED
INCREASE CURRENT DENSITY AND CONTINUE BRUSH PLATING

1. A method of plating directly on a surface of conductive plastic, comprising:

choosing at least one contact point on a surface of the plastic for a cathode lead spaced not more than about 12 inches from the area to be plated;

cleaning the area to be plated and the contact point with a solvent that will not appreciably attack the plastic;

preparing the contact point and connecting a cathode lead to the contact point; and

brush plating the area to be plated at a current density sufficiently low to prevent overheating of and damage to the plastic, using an alkaline plating solution.

4,481,082

METHOD OF MAKING RINGS

Nicolas A. Papanicolaou, Silver Spring, Md., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Nov. 10, 1982, Ser. No. 440,783
Int. Cl.³ C25D *5/34*
U.S. Cl. 204—38 B **5 Claims**

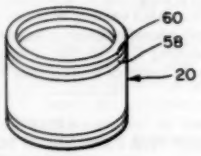
1. A method of making small ceramic rings having electrically insulative sidewalls and electrically conductive upper and lower faces comprising the steps of:

(a) placing a plurality of electrically insulative ceramic tubes closely adjacent each other into a cylinder, each tube having the same diameter as one of said rings;

(b) immersing one end of said cylinder in a bath of a bonding material in liquid form, said tubes having diameters sized sufficiently small and the spaces between said tubes being sufficiently small for enabling capillary action to cause said bonding material to fill said tubes and the spaces between said tubes;

(c) cooling said bonding material until it solidifies within said cylinder;

(d) slicing said cylinder into a plurality of wafers, each of said wafers having two faces;



(e) lapping both faces of each of said wafers to reduce the thickness thereof to a predetermined value;

(f) polishing both faces of each of said wafers;

(g) rinsing said wafers with at least one cleaning solution;

(h) metalizing both faces of each of said wafers with at least one layer of an electrically conductive metal coating;

(i) immersing each of said wafers in a solvent and vibrating said wafers and selectively scoring said metal coatings for thereby dissolving said bonding material in said wafers and removing portions of said metal coatings from other than around said upper and lower faces of said rings thereby leaving as a residual product said rings having electrically insulative ceramic sidewalls and electrically conductive upper and lower faces.

4,481,083

PROCESS FOR ANODIZING ALUMINUM FOIL

John A. Ball, Grassy Creek, N.C., and John W. Scott, Clinton, Tenn., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 31, 1983, Ser. No. 528,184
Int. Cl.³ C25D *11/16;* **C25D** *11/08*
U.S. Cl. 204—38 A **8 Claims**

1. In an improved process for the anodization of aluminum foil for electrolytic capacitors including first forming a hydrous oxide layer on said foil prior to anodization of said foil, and repeatedly interrupting said anodization to stabilize said foil in a mildly alkaline bath, the improvement comprising conducting said anodization in a bath containing an aqueous solution of 10 to 120 g/l boric acid and 2 to 50 ppm phosphate as electrolyte at a pH of 4.0 to 6.0 and a temperature of 85° to 95° C., whereby said foil can be anodized to 760 V without scintillation.

4,481,084

ANODIZATION OF ALUMINUM ELECTROLYTE CAPACITOR FOIL

Chia-Tien Chen, Williamstown, Mass., and Gudrun Hutchins, Pownal, Vt., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 16, 1984, Ser. No. 600,239
Int. Cl.³ C25D *11/12*
U.S. Cl. 204—42 **13 Claims**

1. A process for increasing the capacitance of anodized aluminum electrolytic capacitor foil by electrolytically anodizing said foil at an average current density between 20 μA and

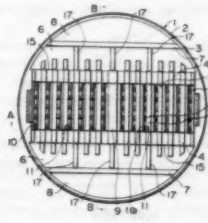
3 mA per cm^2 of effective surface area in an aqueous electrolyte consisting essentially of an unsubstituted aliphatic dicarboxylic acid containing 0 to 0.05 wt. % of an additive selected from the group of citric acid and tartaric acid to form a barrier layer oxide on said foil having an increased crystalline oxide content, and passing said foil through at least one relaxation and reanodization step to stabilize said foil.

4,481,085

APPARATUS AND METHOD FOR ELECTROLYSIS OF $MGCL_2$

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-Ku, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,740
Claims priority, application Japan, Mar. 16, 1982, 57-41571
Int. Cl.³ C25C *3/04, 7/00*
U.S. Cl. 204—70 **20 Claims**



1. Apparatus for electrolysis of $MgCl_2$, comprising an air-tightly sealed shell of metallic material, said shell exhibiting in horizontal cross section a rounded profile which comprises at four portions a curve selected from a quarter-circular arc and a quarter-elliptical arc, means for forcibly cooling said shell from outside, a wall structure which comprises an insulative refractory which is provided along said shell, an electrolysis chamber defined by said wall structure and a pair of primary partitions extending in parallel with each other across the wall structure, a separation chamber located in adjacency with the electrolysis chamber for stripping magnesium metal from an electrolytic bath, at least one pair of anode and cathode arranged in the electrolysis chamber, at least one bipolar intermediate electrode arranged between the anode and cathode, and a top cover provided air-tightly over the electrolysis chamber and the separation chamber.

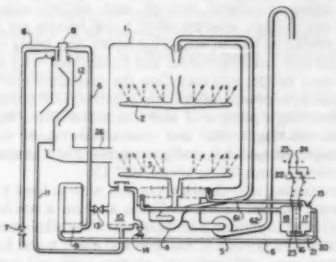
4,481,086

DISHWASHER WITH ELECTROCHEMICAL CELL

Giuseppe Bianchi, Milan, and Claudio Milocco, Pordenone, both of Italy, assignors to Industrie Zanussi S.p.A., Pordenone, Italy

Filed Nov. 23, 1982, Ser. No. 444,816
Claims priority, application Italy, Dec. 14, 1981, 45739 A/81
Int. Cl.³ D06F *39/02*; C25B *1/26*
U.S. Cl. 204—78 **8 Claims**

1. A dish washing machine comprising:
a wash tank for receipt of dishes to be washed;
a hydraulic circuit for receiving water from a water supply source and for supplying the water to said wash tank;
an electrochemical cell means for generating chlorine gas by the electrolysis of a brine solution, said electrochemical cell being connected to said hydraulic circuit;
salt container means, connected to said hydraulic circuit by at least one valve, for forming brine and supplying brine to said electrochemical cell means;
at least one chlorine gas supply conduit connecting said electrochemical cell means to said wash tank for supplying chlorine gas from said electrochemical cell means to the interior of said wash tank; and
said electrochemical cell means being connected in series with said hydraulic circuit at a position downstream of the



position of connection of said salt container means to said hydraulic circuit.

4,481,087

PROCESS FOR REMOVING CHROMATE FROM SOLUTION

Peter M. DiGiacomo, Mission Viejo, Calif., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 23, 1981, Ser. No. 334,011
Int. Cl.³ C25G *1/26*
U.S. Cl. 204—95 **15 Claims**

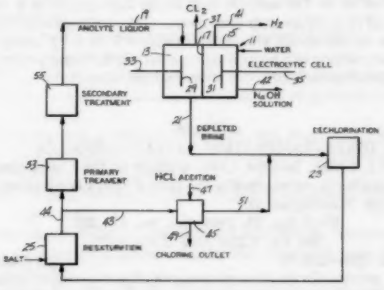
1. A process for removing dissolved chromium in the form of chromate or dichromate ions from an aqueous solution containing from about 50 to about 2000 mg/liter of dissolved chromium, and in addition to chromium, sodium chlorate, sodium hypochlorite and sodium chloride, which comprises contacting said solution with an adsorbent of formula FeO(OH) at conditions whereby said chromium is adsorbed on said adsorbent, wherein said adsorbent is a granular, porous, high surface area, black material prepared by a process which comprises precipitating FeO(OH) from an aqueous solution containing ferric nitrate by contacting said solution with ammonium hydroxide, removing said precipitate from said aqueous solution, drying said precipitate, and grinding said dried precipitate to obtain a coarse powder.

4,481,088

REMOVAL OF CHLORATE FROM ELECTROLYTE CELL BRINE

Sanders H. Moore, and Ronald L. Dotson, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 6, 1982, Ser. No. 395,753
Int. Cl.³ C25B *1/16*
U.S. Cl. 204—98 **8 Claims**



1. In a process for purifying an alkali metal halide brine

liquor used in the production of an alkali metal hydroxide and a halogen by electrolysis in a membrane cell having an anolyte and a catholyte compartment, said alkali metal halide brine liquor being circulated through said anolyte compartment during electrolysis, wherein alkali metal halates are produced within said brine liquor, said brine liquor then being recovered from said cell, dehalogenated, and resaturated with additional alkali metal halide, and recycling the resaturated brine liquor to said anolyte compartment, the improvement comprising:

(a) diverting a portion of said resaturated brine liquor after said dehalogenation and resaturation steps have been completed, said diverted portion being at a temperature of between about 90° to about 105° C.;

(b) contacting said diverted portion with at least a stoichiometric amount of hydrochloric acid for a residence time sufficient to reduce essentially all of the alkali metal halate within said portion to halogen and alkali metal halide; and

(c) combining said contacted portion with said brine liquor recovered from said cell to reduce the total alkali metal halate content of the resulting combined stream to an acceptable level.

4,481,089

METHOD FOR DECONTAMINATING METALS CONTAMINATED WITH RADIOACTIVE SUBSTANCES

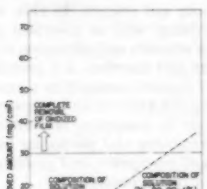
Tatsuo Izumida, Hitachi; Koji Kato, Matsudo, and Fumio Kawamura, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Plant Engineering and Construction Co., Ltd., both of Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,543

Claims priority, application Japan, Feb. 23, 1983, 58-27703

Int. Cl.³ C25F *1/00, 3/02, 5/00*

U.S. Cl. 204—129.43 **13 Claims**



1. A method for electrolytically decontaminating metals which have been contaminated on their surfaces with radioactive substances, which comprises subjecting a metal to be decontaminated to an alternating electrolysis treatment consisting of alternately repeated cathode electrolysis in a unit period of 30 to 180 seconds and anode electrolysis in a unit period of 15 to 60 seconds with a ratio of the cathode electrolysis time to the anode electrolysis time of 1 to 4 by using an aqueous solution of a neutral salt as electrolyte, thereby removing the radioactivated oxide films and metal surfaces.

4,481,090

DECONTAMINATING METAL SURFACES

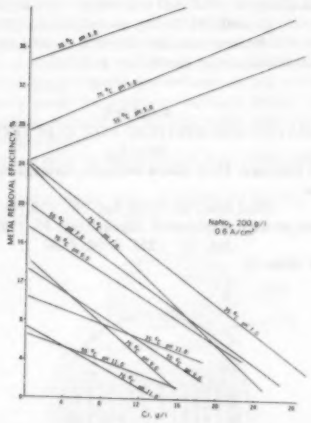
Everett L. Childs, Boulder, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 23, 1984, Ser. No. 573,252

Int. Cl.³ C25F *3/02, 3/06, 3/10*

U.S. Cl. 204—129.75 **21 Claims**

1. A process for decontaminating an object having a surface contaminated with a radioactive substance, comprising contacting said surface with a basic aqueous solution comprising borate anions, oxalate anions and nitrate anions in an amount equivalent to or greater than 600 g/l of sodium nitrate; thereafter electrolytically removing the top layer of said surface and



forming a precipitate containing said radioactive substance; and subsequently separating said precipitate from the solution.

4,481,091

CHEMICAL PROCESSING USING ELECTROMAGNETIC FIELD ENHANCEMENT

Louis E. Brus, Madison, N.J., and Abraham Nitzan, Tel Aviv, Israel, assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 234,710, Feb. 17, 1981, abandoned. This application Oct. 21, 1983, Ser. No. 544,396

Int. Cl.³ C07G *13/00*

U.S. Cl. 204—157.1 R **26 Claims**

1. A method for photochemically reacting an atom or molecule having at least one absorption wavelength, the method comprising

(a) irradiating the atom or molecule with reaction-effecting electomagnetic radiation comprising a given wavelength, the invention *CHARACTERIZED IN THAT,*

(b) during at least a portion of the irradiation, a field enhancing body of characteristic dimension between about 5 Å and the given wavelength is also irradiated with the electromagnetic radiation, the field enhancing body, when irradiated, having an associated enhanced field, due to a dielectric polarizability resonance in the spectral region of the given wavelength, a corona effect, or an image effect,

(c) the field enhancing particle is selected to have its polarizability resonance in the spectral range of the given wavelength, and

(d) the given wavelength is selected to be in the spectral range of the absorption wavelength of the atom or molecule.

4,481,092

PHOTO-INITIATED EPOXIDATION OF ALLYL CHLORIDE

Kevin T. Mansfield, North Kingston, R.I., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 450,814, Dec. 20, 1982, abandoned. This application Jun. 8, 1983, Ser. No. 502,384

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **5 Claims**

1. A method for the preparation of epichlorohydrin by the epoxidation of allyl chloride which comprises

irradiating with the radiation of a 450 watt medium-pressure

mercury lamp an oxygen-saturated solution of allyl chloride in an aprotic solvent in the presence of an effective amount of an alpha-diketone sensitizer for sufficient time to effect epoxidation of the allyl chloride to epichlorohydrin.

4,481,093

ULTRAVIOLET CURABLE BASECOATS FOR VACUUM METALLIZATION

Edward J. Murphy, Mt. Prospect; Ronald J. Lewarchik, Arlington Heights, both of Ill., and Jeffrey W. Thompson, Centerville, Ohio, assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 311,057, Oct. 13, 1981, Pat. No. 4,416,750. This application Sep. 30, 1983, Ser. No. 537,695

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.[3] **C08G** *18/00, 63/00*

U.S. Cl. 204—159.19 **1 Claim**

1. An ultraviolet light-curable liquid coating composition for molded plastic objects comprising an alcoholic solvent solution of:

(1) a polyurethane oligomer polyacrylate which is a derivative of an organic solvent-soluble hydroxy functional polyester having an average molecular weight of 500–1500 and an average of at least about 2.0 hydroxy groups per molecule, each hydroxy group carrying an acrylate ester group by a plurality of urethane linkages; and

(2) an hydroxy-functional polyacrylate which is constituted by an organic polyol having a molecular weight below 500 and at least about 3 hydroxy groups per molecule, said polyol being esterified to contain at least about 1.5 acrylate ester groups per molecule and having at least about 0.5 unreacted hydroxy groups per molecule; said polyacrylate ester being present in an amount of from more than 50% up to 70% of total polyacrylate, and said solution having a solids content of from 65% to 90%, said solution further including a photoinitiator to render the composition curable on exposure to ultraviolet light.

4,481,094

STABILIZED POLYACRYLAMIDE GELS AND SYSTEM FOR SDS ELECTROPHORESIS

Aurora Fernandez de Castro, Union, Mich., and Jerry L. Neff, Nappanee, Ind., assignors to TechAmerica Group, Inc., Elwood, Kans.

Continuation of Ser. No. 378,902, May 17, 1982, abandoned. This application Nov. 2, 1983, Ser. No. 548,042

Int. Cl.[3] **C25B** *7/00*

U.S. Cl. 204—180 G **5 Claims**

1. A buffer system for conducting discontinuous sodium dodecyl sulfate polyacrylamide gel electrophoresis, comprising (a) a stabilized polyacrylamide gel medium containing a gel buffer of a salt of 2-amino-2-methyl-1,3-propanediol at a pH of about 6.4 to 7.3, and (b) 2-amino-2-methyl-1,3-propanediol taurine, at a pH of about 8.0 to 10.0 as an elctrolyte buffer.

4,481,095

APPARATUS FOR SUPPLYING A WORKING FLUID AND A WIRE ELECTRODE TO A WORK PORTION OF A WIRE-CUT ELECTRICAL DISCHARGE MACHINE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Feb. 2, 1983, Ser. No. 463,136

Claims priority, application Japan, Feb. 3, 1982, 57-14497[U]; Nov. 30, 1982, 57-209548

Int. Cl.[3] **C25F** *7/00;* **B23K** *9/28, 9/30*

U.S. Cl. 204—224 M **26 Claims**

1. An apparatus for supplying a working fluid and a wire electrode to a work region of a wire-cut electrical discharge machine, comprising:

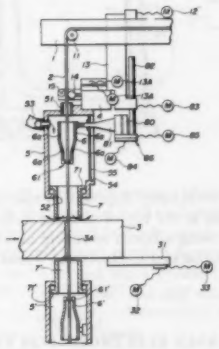
a support member,

a housing member supported by said support member, said housing member having opposed first and second openings,

means for passing a wire electrode through said housing member via said openings into operative association with a workpiece to be operated on by said electrode,

means for supplying a working fluid under pressure into the housing member,

first nozzle means slidably supported by said housing member and projecting towards the workpiece to form an operative gap therewith, said first nozzle means being mounted to discharge working fluid against said workpiece at said gap along and coaxially with said wire electrode which travels therethrough,



guide die means in said housing member for guiding said wire electrode through said housing member and said first nozzle means while also conveying working fluid therethrough,

means located outside said housing member for supplying electrical energy to said wire electrode before it enters said housing member,

and second nozzle means supported by said housing member for discharging working fluid against said means for supplying electrical energy to cool the same.

4,481,096

POT-TYPED WATER PURIFIER WITH ELECTROLYZER

Tatsuo Okazaki, 7-18, Nishi- 2 chome, Kamifukuoka-shi, Saitama-ken, Japan

Filed Dec. 23, 1983, Ser. No. 565,056

Claims priority, application Japan, Dec. 28, 1982, 57-229384

Int. Cl.[3] **C25B** *9/00, 15/08*

U.S. Cl. 204—265 **3 Claims**

1. A pot-type water purifier with an electrolyzing function comprising:

a pot body having an opening at the top thereof,

a pouring nozzle,

the pot body including therein an electrolyzing vessel,

a porous partition dividing the electrolyzing vessel into two chambers,

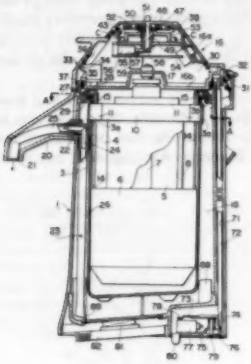
negative and positive electrodes in said respective chambers to form negative and positive electrode chambers respectively,

a storage chamber airtightly separated from said electrolyzing vessel,

means for liquid communicating said storage chamber with said negative electrode chamber and with said pouring nozzle,

means for alternatively supplying air pressure to said negative electrode chamber and storage chamber to transport water from said negative electrode chamber to said stor-

age chamber or to transport water from said storage chamber to said pouring nozzle, respectively, and



a cover detachably disposed on said pot body to close said opening at the top of said pot body, said opening, when open, being adapted to enable supplying water from said opening to said electrolyzing vessel.

4,481,097

DURABLE ELECTRODE FOR ELECTROLYSIS

Hiroshi Asano, Chiba; Takayuki Shimamune, Tokyo; Kazuhiro Hirao, and Ryuta Hirayama, both of Kanagawa, all of Japan, assignors to Permelec Electrode Ltd, Kanagawa, Japan

Filed Jan. 31, 1984, Ser. No. 575,602
Claims priority, application Japan, Jan. 31, 1983, 58-12919
Int. Cl.³ C25B *11/08, 1/26*
U.S. Cl. 204—290 F **6 Claims**

1. An electrolytic electrode comprising a substrate of a conducting metal, an intermediate layer deposited on the surface of said substrate, and a coating of an electrode active substance deposited on the surface of said intermediate layer, said intermediate layer comprising platinum dispersed in a conducting mixed oxide consisting of an oxide of at least one metal selected from the group consisting of titanium and tin, each having a valence of 4, and an oxide of tantalum having a valence of 5.

4,481,098

FRAME FOR SUPPORTING AND TREATING SPENT ELECTRICAL ACCUMULATORS IN PROCESSES FOR THE ELECTROCHEMICAL EXTRACTION OF THE METALS CONTAINED THEREIN

Marco Ginatta, Turin, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

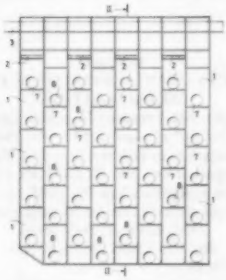
Filed May 11, 1983, Ser. No. 493,628
Claims priority, application Italy, May 27, 1982, 21510 A/82
Int. Cl.³ C25D *17/04*
U.S. Cl. 204—297 W **13 Claims**

1. A frame for supporting and treating spent electrical accumulators in processes for the electrochemical extraction of the metals contained therein comprising:

(i) a plurality of parallelepiped compartments, each said compartment housing an electrical accumulator having at least one pole for receiving an electrical contact;

(ii) two current-carrying bars connected to said frame at its top end, one of said current-carrying bars being negative and composed of a steel tube clad in sheet copper and the other said current-carrying bar being positive and composed of a copper plate; and

(iii) a plurality of cables covered with insulating material, each said cable connected at one end to one of said current-carrying bars and having said electrical contact on its



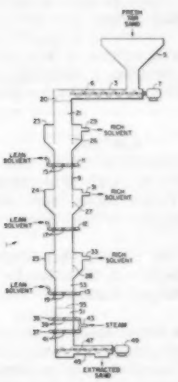
opposite end for receiving and protectively engaging said pole of said electrical accumulator.

4,481,099

SOLVENT EXTRACTION METHOD

David S. Mitchell, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 26, 1979, Ser. No. 79,121
The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.
Int. Cl.³ C10G *1/04*
U.S. Cl. 208—11 LE **8 Claims**



1. A method for solvent extracting an extractable component from a mixture including said extractable component and subdivided solids, comprising:

(a) maintaining a vertically extending downwardly moving packed bed comprising said solids in a vertically extending extraction zone and introducing said mixture into an upper portion of said bed;

(b) providing a substantially continuous gaseous phase in contact with a lower portion of said bed;

(c) maintaining a substantially continuous liquid phase comprising a vaporizable liquid solvent in contact with at least a lower part of an upper portion of said bed;

(d) introducing said solvent into said liquid phase at at least two vertically spaced levels of said liquid phase;

(e) extracting said extractable component from said mixture with said solvent;

(f) withdrawing said solvent and said extractable component from said liquid phase between said two vertically spaced levels;

(g) preventing said liquid phase from flowing downwardly through said lower portion of said bed by maintaining said gaseous phase at a pressure sufficient to support said liquid phase thereon and vaporizing solvent adhering to solids in said lower portion of said bed; and

(h) withdrawing solids from said lower portion of said bed.

4,481,100

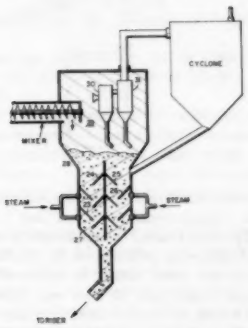
SURGE BIN RETORTING SOLID FEED MATERIAL

Clinton R. Kennedy, Talleyville, Del., and Frederick J . Krambeck, Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,576

Int. Cl.³ C10G *1/02*

U.S. Cl. 208—11 R **2 Claims**



1. The method of retorting hydrocarbons from solid feed material comprising:

mixing hot circulating solid heat carrier material produced in said method with raw feed material to induce retorting:

reheating said circulating solid heat carrier material and conveying it to said mixer;

supplying a mixture of said solid heat carrier and partially retorted feed material from said mixer to a surge bin;

baffling the flow of said mixture through said surge bin to promote uniform flow and to improve further retorting of said material in said surge bin;

supplying gas retorted from the material in said surge bin to a series of separators positioned in the upper section of said surge bin, each having a disengaging volume to disengage said gas from solid material carried by said gas; and

supplying steam to said surge bin at a temperature which promotes stripping to remove entrained hydrocarbons from said solid material.

4,481,101

PRODUCTION OF LOW-METAL AND LOW-SULFUR COKE FROM HIGH-METAL AND HIGH-SULFUR RESIDS

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 224,778, Jan. 13, 1981, Pat. No. 4,334,976, which is a continuation-in-part of Ser. No. 186,927, Sep. 12, 1980, Pat. No. 4,317,711. This application Aug. 25, 1982, Ser. No. 411,141

Int. Cl.³ C10B *55/02*

U.S. Cl. 208—50 **20 Claims**

11. A continuous process for producing low-metal and low-sulfur coke of high quality from high-metal and high-sulfur resids and for recovering the metal values of said resids, said process comprising the following steps:

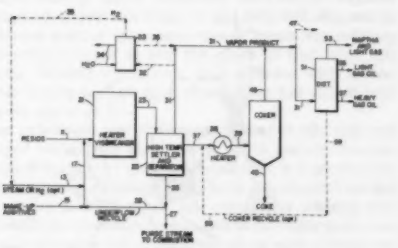
A. heating a feed admixture of said resids, particulate solids, and a gas under visbreaking conditions to form a visbroken admixture;

B. settling said visbroken admixture at high temperature and separating therefrom a first vapor product, a liquid product, and an underflow stream;

C. separating a purge stream from said underflow stream of Step B;

D. burning said purge stream for recovering heat and said metal values;

E. recycling and combining the remainder of said underflow



stream of Step B with a make-up amount of said particulate solids of Step A for admixing with said resids and said gas of Step A for forming said feed admixture of Step A;

F. heating and coking said liquid product to produce said high quality coke and a second vapor product; and

G. distilling said first vapor product and said second vapor product to produce a plurality of demetallized and desulfurized liquid hydrocarbon products.

4,481,102

CRACKING WITH CATALYTICALLY ACTIVE AMORPHOUS SILICA

Dean A. Young, Yorba Linda, and Jeffery W. Koepke, La Habra, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 356,351, Mar. 9, 1982, Pat. No. 4,414,137. This application Aug. 25, 1983, Ser. No. 526,866

Int. Cl.³ C10G *11/04, 11/05*

U.S. Cl. 208—120 **13 Claims**

1. A process for promoting a cracking reaction by contacting a hydrocarbon feed stock under cracking conditions with a catalyst prepared by a method comprising forming a hydrogel or precipitate in a reaction mixture comprising water, silicate anions and an organic reactant selected from the group consisting of amines having a pK_a value above about 10.0, quaternary ammonium cations having a nitrogen atom bonded to four carbon atoms, quaternary phosphonium cations having a phosphorus atom bonded to four carbon atoms, precursors of the foregoing and mixtures thereof, and dehydrating the resultant hydrogel or precipitate to yield a product containing amorphous silica.

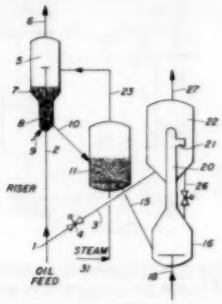
7. In a catalytic cracking process wherein a hydrocarbon feedstock is contacted under cracking conditions with a catalyst, the improvement comprising employing as a catalyst a composition prepared by a method comprising acidifying a reaction mixture comprising sodium silicate, water, and a quaternary ammonium cation having a nitrogen atom bonded to four carbon atoms, said acidification resulting in a pH between 8 and 12 and said carbon atoms each being members of alkyl groups containing between 1 and 6 carbon atoms, allowing a hydrogel to form in the reaction mixture maintaindd at a temperature below 95° C., recovering the hydrogel from the remainder of the reaction mixture, removing sodium from the hydrogel by washing, dehydrating said hydrogel to produce a product containing a substantial proportion of silica gel, and admixing a cracking component into said silica gel.

4,481,103

FLUIDIZED CATALYTIC CRACKING PROCESS WITH LONG RESIDENCE TIME STEAM STRIPPER

Frederick J. Krambeck, Cherry Hill; Donald M. Nace, Woodbury, both of N.J., and Paul H. Schipper, Newark, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 19, 1983, Ser. No. 543,666
Int. Cl.³ C10G *11/02*
U.S. Cl. 208—120 **9 Claims**



1. In a process for catalytic cracking of a sulfur containing hydrocarbon charge by contacting said charge at cracking temperature with a circulating inventory of cracking catalyst to produce cracked vapor product and spent catalyst with deposits of coke and sulfur compounds, wherein at least a portion of said spent catalyst is regenerated with an oxygen-containing gas at regeneration conditions including a regeneration temperature higher than said cracking temperature and sufficient to burn at least a portion of said coke and said sulfur deposits to generate oxides of carbon and sulfur oxides and regenerated catalyst with reduced coke content which is recycled to contact said hydrocarbon charge, the improvement comprising subjecting said spent catalyst to stripping at a temperature of 500° to 700° C with steam for about 1 to minutes, said improved process being further characterized by the absence of oxygen during said stripping and the absence of any SO_x removal additives on said catalyst.

4,481,104

USE OF LOW ACIDITY HIGH SILICA TO ALUMINA RATIO LARGE PORE ZEOLITES FOR DISTILLATE PRODUCTION IN CATALYTIC CRACKING

Dennis E. Walsh, Richboro, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 315,322, Oct. 26, 1981, abandoned. This application Feb. 14, 1984, Ser. No. 579,286
Int. Cl.³ C10G *11/05, 11/18*
U.S. Cl. 208—120 **5 Claims**

1. In the process for the catalytic cracking of gas oil to produce products boiling in the naphtha and distillate fuel range wherein said gas oil is contacted at elevated temperatures over a catalyst comprising a zeolite, the improvement which comprises utilizing as a catalyst a composition comprising a matrix and a crystalline aluminosilicate zeolite, said crystalline aluminosilicate zeolite being characterized by

(1) a framework silica-to-alumina ratio greater than ~100;

(2) a pore size greater than about at least 8 Angstrom units;

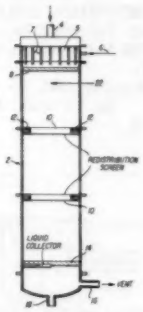
(3) an alpha value no greater than 3 as a result of said zeolite having had its activity reduced by treatment of the same with alkali metal cations at a pH of from 4 to 6.

4,481,105

PROCESSING OF HYDROCARBONS IN FIXED CATALYST BED WITH REDISTRIBUTION MEANS

Tai-Sheng Chou, Sewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1982, Ser. No. 411,142
Int. Cl.³ C10G *11/10*
U.S. Cl. 208—146 **11 Claims**



1. In a process for downwardly passing a liquid at a relative liquid linear velocity equal to or less than 0.3 cm/sec over a bed of catalyst in a reactor vessel means to effect a chemical reaction and removing products of the reaction from the bottom of the reactor vessel means, an improvement comprising:

passing said liquid over at least one redistribution means located within the bed of catalyst to improve liquid distribution throughout the bed and to improve contact of the liquid with the bed of catalyst, each of said redistribution means occupying at least 70 percent of a substantially central portion of the cross sectional area of said reactor vessel means, and the portion of the cross-sectional area between the redistribution means and the inside wall of the reactor vessel, at the elevation at which said redistribution means is located, being occupied by a second fixed porous bed of material comprised of substantially solid particles of a size relatively smaller than the particles of the bed of catalyst.

4,481,106

HYDROCARBON TREATING PROCESS

Thomas A. Verachtert, Wheeling, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 5, 1983, Ser. No. 558,243
Int. Cl.³ C10G *19/00, 19/02*
U.S. Cl. 208—206 **16 Claims**

1. A process for sweetening hydrocarbon streams to reduce the concentration of mercaptan compounds contained therein which comprises the steps of:

(a) forming a reaction zone charge stream by admixing a liquid phase hydrocarbon feed stream which comprises a mercaptan with an oxygen supply stream and with a liquid phase first aqueous stream which comprises an alkaline reagent and soluble oxidation catalyst;

(b) passing the reaction zone charge stream downward through a fixed mass of contact material located within a vertically oriented vessel at oxidation-promoting conditions, the mass of contact material extending from an upper portion of the vessel downward to at least the lowermost quarter of the vessel;

(c) separating the liquids flowing downward through the mass of contact material in the lowermost quarter of the vessel by a method which comprises withdrawing the liquids through a vertical porous wall into an annular separation zone which is located in the lower portion of the vessel and surrounds the lower portion of the mass of

contact material, and decanting the liquids into a hydrocarbon phase comprising disulfide compounds which rises into an open-bottomed covered volume, which is located above the porous wall and separated by impervious upper and side walls from the mass of contact material, and an aqueous phase comprising the alkaline reagent which settles to the bottom of the vessel;

(d) withdrawing a treated hydrocarbon product stream from the open-bottomed volume, and withdrawing a second aqueous stream from the lower portion of the vessel; and

(e) employing at least a portion of the second aqueous stream as the previously referred to first aqueous stream.

4,481,107

OXIDATION OF DIFFICULTLY OXIDIZABLE MERCAPTANS

Peter Urban, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 6, 1984, Ser. No. 597,310
Int. Cl.³ C10G *19/00, 19/02, 29/00*
U.S. Cl. 208—206 **18 Claims**

1. A process for oxidizing difficultly oxidizable mercaptans contained in a hydrocarbon fraction which comprises:

(a) adding a hydrocarbon soluble alkali metal compound, capable of forming the alkali metal mercaptides of the difficultly oxidized mercaptans, to said hydrocarbon fraction; and

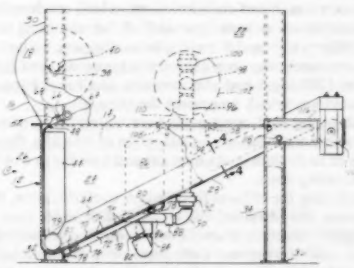
(b) contacting the resulting hydrocarbon fraction containing said hydrocarbon soluble alkali metal compound with a metal chelate catalyst disposed on an adsorptive support in the presence of a hydrated oxygen-containing gas wherein the gas is hydrated up to the saturation point of the gas and in the absence of a separate water phase.

4,481,108

BELT FILTER

Jack R. Bratten, 5970 St. James Dr., West Bloomfield, Mich. 48033

Filed Nov. 29, 1982, Ser. No. 445,052
Int. Cl.³ B01D *29/02*
U.S. Cl. 210—137 **9 Claims**



1. A belt filter comprising:

an open-topped tank having an interior space adapted to receive a quantity of liquid to be filtered to establish a liquid level in said tank, said tank including a collection chamber and a partition separating said collection chamber and said tank interior space, said partition having openings therethrough to allow flow of liquid from said tank interior into said collection chamber through said partition openings;

a supply roll of elongated disposable filter media comprising a filter belt, said filter belt extending from a point above the level of liquid downwardly through said tank interior to overlie said partition and thence upwardly above the level of liquid in said tank;

means for collecting said filter belt media after passing through said tank interior;

means for periodically advancing said filter belt through said tank interior space to position a fresh section of filter belt over said partition;

said filter belt having side edges extending parallel to the direction of said advancing motion of said filter belt through said tank interior space;

inflatable sealing means extending substantially entirely along both of said side edges of said filter belt disposed in said tank interior space and control means for inflating said sealing means to seal the edges of said filter belt during filtering operations, and deflating said sealing means during said advance of said filter belt in said tank interior space; and,

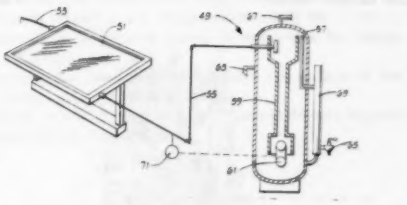
further including a pair of recesses formed in said tank and located within said tank interior space entirely through levels of liquid to be disposed in said tank, a respective one of said recesses extending along each side of said filter belt to receive said filter belt side edges and wherein said inflatable seal means includes a pair of inflatable tubes, one of said inflatable tubes extending along and within a respective one of said recesses so as to sealingly engage said filter belt side edges upon inflation.

4,481,109

SOLAR HEAT TREATING OF WELL FLUIDS

Orvel L. Stewart, 118 E. Charles, Pauls Valley, Okla. 73075

Continuation of Ser. No. 35,494, May 3, 1979, Pat. No. 4,289,204. This application Jun. 29, 1981, Ser. No. 278,686
Int. Cl.³ B01D *17/04*
U.S. Cl. 210—149 **3 Claims**



1. An apparatus for demulsifying an oil and water emulsion, comprising:

a. a tank for holding the emulsion;

b. solar heating means for heating the emulsion;

c. an outlet conduit connected for conducting the emulsion from the tank to the solar heating means;

d. an inlet conduit connected for conducting the heated emulsion from the solar heating means to the tank;

e. pumping means for circulating the emulsion from the tank through the outlet conduit, the solar heating means, and the inlet conduit, back to the tank; and

f. controlling means for enabling said pumping means such that the emulsion is circulated only when the solar heating means can heat the emulsion.

4,481,110

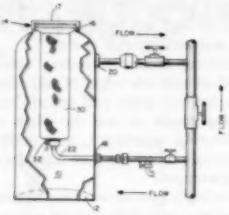
FEEDER FILTER BAG FOR BYPASS FEEDERS

James E. Shannon, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 13, 1983, Ser. No. 484,654
Int. Cl.³ B01D *35/02, 25/30*
U.S. Cl. 210—199 **1 Claim**

1. In a bypass feeder of the type comprising a tank having a closeable rounded top opening, means defining an inlet opening and means defining an outlet opening positioned on the side of the tank, a rectangular frame filter bag holder dimensioned to fit inside the tank, said frame having its bottom portion fitted

with a plug having a tapered round opening, an L-shaped inlet pipe received into the tapered opening of the plug, a filter bag dimensioned to fit over the filter bag holder and having a drawstring adjustable bottom opening for fitting the opening



tightly against the plug, the improvement which comprises the filter bag also having an open top and a sealing ring having slightly tapered sides engaging the open inside top of the filter bag and force sealing it against the inside of the closeable rounded top opening.

4,481,111

SELF-CLEANING FILTER WITH MOTOR INCORPORATED THEREWITH

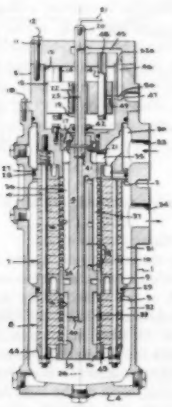
Théophile J. Christophe, Fontenay-le-Fleuri, and Jean-Claude P. Moatti, Boulogne-Billancourt, both of France, assignors to Georges Moatti, Saint-Cyr-l'Ecole, France

Filed Oct. 11, 1983, Ser. No. 540,998

Claims priority, application France, Oct. 11, 1982, 82 16982

Int. Cl.³ B01D *29/38*

U.S. Cl. 210—333.01 **5 Claims**



1. A filter apparatus comprising a housing, first and second separate filtering zones provided in said housing, means isolating said filtering zones from each other, each of said filtering zones containing a stack of filtering elements, each of said stacks of filtering elements being coaxial to each other, tubular means defining an elongated bore extending through both of said filtering zones, at least one admission orifice in said housing for receiving fluid to be filtered, an elongated rotary fluid distributor having a first end in communication with fluid received from said admission orifice and also having a second end; said rotary fluid distributor matingly extending coaxially through said tubular means and said stacks of filtering elements, flow passageways provided in said rotary distributor for directing fluid through and receiving fluid from at least one of said filtering zones, a driving motor coupled to said distributor for rotating the distributor about its axis and wherein the second end of the distributor is not connected to the filter body and is guided for rotation solely by said bore in said tubular member and wherein the second end of the distributor is contained in the second filtering zone and wherein the fluid flows from the outer periphery of the filtering elements contained in the second filtering zone radially inward into said bore and then into one of said passageways comprising a chamber provided in the periphery of the distributor and said passageways further including an internal conduit in the distributor connecting said chamber with the first end of the distributor.

4,481,112

PROCESS OF TREATING GAS CONDENSATE

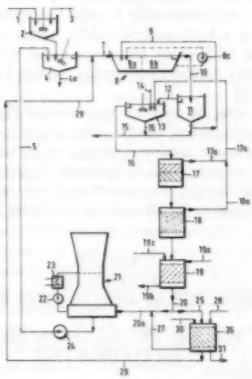
Hans Hitzel, Dietzenbach, Fed. Rep. of Germany, assignor to Hans Hitzel, Inc., Fed. Rep. of Germany

Filed Jul. 27, 1983, Ser. No. 517,880

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229019

Int. Cl.³ C02F *9/00*

U.S. Cl. 210—620 **2 Claims**



1. In a process for treating gas condensate from a coal gasifying plant or a coal-based chemical plant, which condensate has a total content of at least 2 mval/l of the anions SO_4^{--}, SCN^-, NO_3^-, Cl^- and F^- and contains organic matter in an amount corresponding to a chemical oxygen demand (COD) of at least 1000 mg/l and also contains alkali metal ions and ammonium ions, which comprises the steps of:

(A) subjecting said condensate to a biological purification including nitrification at a pH value of 6 to 8 in the presence of an oxygen containing gas and a sludge in a biological treating zone,

(B) subjecting the effluent from step A to clarification, fluocculation and filtration, the effluent withdrawn from said filtration having a fluoride ion content per liter of not more than 100 mg and a chemical oxygen demand of not more than 200 mg and also containing the strong anions F^-, Cl^-, NO_3^- and SO_4^{--},

(C) subjecting said effluent withdrawn from said filtration to an anion exchange in the presence of a weakly basic anion exchanger and exchanging a predominant part of said strong anions against HCO_3 ions, the effluent from said anion exchanges being water containing CO_3 and HCO_3 ions, said water having an alkalinity in excess of 2 mval/l,

(D) subjecting a portion of said water to a cation exchange in the presence of a weakly acid cation exchanger in hydrogen form and withdrawing a treated water from said cation exchange,

(E) mixing said treated water with the water from step C not treated in said cation exchange and forming a mixed water, said mixed water having an alkalinity of 2-3 mval/l,

the salt content and the hardness of said mixed water being lower than in the effluent from said anion exchange,

(F) regenerating said cation exchanger by contacting the same with organic acids comprising mainly fatty acids having a dissociation constant in excess of 10^{-5}, and producing a regenerating effluent containing alkali metal ions, feeding said regenerating effluent into the biological purification of step A, and

(G) feeding said mixed water into a cooling tower, evaporating said mixed water partly in said tower and recycling the remaining mixed water to said condensate.

4,481,113

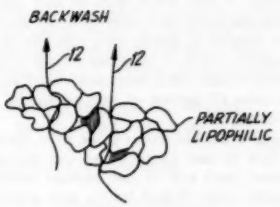
FILTER MEDIA AND METHOD FOR CLEANSING ENTRAINED OILS FROM OIL-IN-WATER EMULSIONS

Gerard P. Canevari, Cranford, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 251,900, Apr. 7, 1981, abandoned. This application May 10, 1982, Ser. No. 376,724

Int. Cl.³ B01J *31/02*

U.S. Cl. 210—680 **22 Claims**



19. In a cyclic process for cleansing oil-in-water emulsions of their dispersed oil wherein said emulsion is passed through a bed of filter media for adsorbing the oil and providing an effluent stream and backwashing said bed when the amount of oil in said effluent stream exceeds a predetermined minimum amount, the improvement comprising charging said bed with a filter medium selected from the group consisting of granular glass which has been treated with caustic and from about 1.5 to 1.8 grams/liter of at least one trialkoxysilane, a mixture of about 50 volume percent granular glass and 50 volume percent granular glass which has been treated with caustic and from about 3 to 3.5 grams/liter of at least one trialkoxysilane, filter sand which has been treated with caustic and from about 3 to 3.5 grams/liter of at least one trialkoxysilane and a mixture of about 50 volume percent of filter sand and about 50 volume percent of said treated filter sand, said trialkoxysilane in all instances having from 1 to 2 carbon atoms in the alkoxy group.

4,481,114

SLUDGE DEWATERING SYSTEM

Morris M. Riise, North Miami, Fla., assignor to International Sludge Reduction Company, Fort Lauderdale, Fla.

Continuation of Ser. No. 202,241, Oct. 30, 1980, Pat. No. 4,382,863, which is a continuation of Ser. No. 98,887, Nov. 30, 1979, abandoned, which is a continuation of Ser. No. 930,529, Aug. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 739,602, Nov. 8, 1976, abandoned. This application May 9, 1983, Ser. No. 493,146

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.³ B01D *27/08*

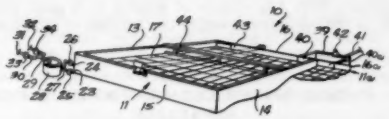
U.S. Cl. 210—702 **27 Claims**

1. An improved process for dewatering sludge on a filter medium, which sludge has been pretreated, where required, with a chemical conditioner to form soft masses of various sizes including larger and smaller sludge masses, wherein the improvement comprises:

(a) passing the sludge onto the upper surface of a multi-layered filter plate comprising:

(i) a thin top layer having a smooth, hard upper surface and a lower surface and consisting essentially of fine aluminum oxide particles, rigidified and then bonded together with a binding agent which does not impede high volume percolation; and

(ii) a bottom support layer composed of relatively coarse aggregate particles, rigidified and then bonded together and to the lower surface of the top layer with a binding agent which does not impede high volume percolation, which filter plate is monolithic and structurally rugged enough to support sludge removal means on the upper surface of the top layer of the filter plate without damage to the filter plate;



(b) permitting the larger sludge masses to settle by force of gravity so that they are pierced by the aluminum oxide particles on the upper surface of the filter plate and form a layer over the upper surface of the filter plate;

(c) applying a vacuum of sufficient strength to draw filtrate from the sludge through the layer of larger sludge masses on the upper surface of the filter plate and through the filter plate, but not so strong as to break down the larger sludge masses, such that the smaller sludge masses are trapped by the already settled larger sludge masses, until the sludge is dewatered to an extend making it removable by sludge removal means; and

(d) removing the dewatered sludge from the surface of the filter plate by sludge removal means;

wherein the process is characterized by rapid dewatering and substantial self-filtering action.

4,481,115

FILTRATION OF SEWAGE SLUDGE

David W. Wade, Bradford, and Graham G. Dawson, Holmefirth, both of England, assignors to Allied Colloids Limited, Bradford, England

Filed Feb. 10, 1983, Ser. No. 465,380

Claims priority, application United Kingdom, Feb. 19, 1982, 8204900

Int. Cl.³ C02F *11/14*

U.S. Cl. 210—727 **12 Claims**

1. A process in which an aqueous suspension of organic solid material is conditioned by adding a water soluble conditioner and then filtering the suspension through a filter press to form a filter cake and in which during the formation of at least the first half (by weight solids), but not all, of the cake the conditioner is a water soluble high molecular weight polyelectrolyte conditioner having a molecular weight above 100,000 and during the formation of the remainder of the cake the conditioner is an inorganic conditioner or a low molecular weight polyelectrolyte conditioner having a molecular weight below 80,000.

4,481,116
CATIONIC AMINOPLASTIC RESIN, PREPARATION PROCESS AND APPLICATION THEREOF TO WATER TREATMENT

Jean Cabestany, Stains, and Claude Trouve, Paris, both of France, assignors to Societe Francaise Hoechst, Puteaux, France

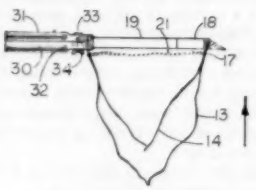
Filed Dec. 9, 1982, Ser. No. 448,094
Claims priority, application France, Dec. 29, 1981, 81 24396
Int. Cl.³ C08G *12/32*
U.S. Cl. 210—735 **20 Claims**

1. A novel water-dispersible cationic aminoplast resin which is a condensation product of melamine, formaldehyde and glyoxal, said resin being salified by a mineral or organic protonic acid or a mixture of these acids selected from the group consisting of hydrochloric, nitric, orthophosphoric, acetic, and formic acids, and containing in molar ratios, for one mole of melamine, from 2 to 4 mole of mineral or organic protonic acid, or the equivalent quantity of a mixture of such acids.

4,481,117
SWIMMING POOL CLEANING METHOD AND APPARATUS

Christopher G. Collins, 13946 Dawson St., Garden Grove, Calif. 92643

Filed Sep. 29, 1982, Ser. No. 426,630
Int. Cl.³ B01D *35/00*
U.S. Cl. 210—776 **5 Claims**



1. A collecting net apparatus for swimming pools and the like comprising:

a planar, ovate frame symmetrical about the short or longitudinal axis of said ovate shape and having a transverse axis substantially longer than said short axis, a convex arcuate forward portion with chord parallel to said transverse axis, each end of said forward portion formed into an angle close to 90 degrees and proceeding rearward to complete the ovate shape and terminating in short ends projecting rearwardly, parallel to said short axis, said frame being moderately resilient along said short axis but substantially rigid normal to said plane;

a net formed from a single piece of foraminous material into an outer cylinder with one end closed to form a pouch, said outer cylinder passing outwardly of said frame and folded inwardly over said frame to form a reentrant, open-ended inner cylinder, said inner cylinder tapering so that the end of said inner cylinder opposite said frame is smaller in perimeter than said outer cylinder and said inner cylinder is shorter than said outer cylinder, said inner and outer cylinders being loosely secured to said frame by a seam adjacent to and parallel to said frame, both of said cylinders depending perpendicularly therefrom;

a protective cover of three portions easily attached over said frame and said folded net and conforming thereto having a center blade-like portion covering said arcuate forward portion of said frame and extending far enough beyond each end of said arcuate forward portion to cover said angles, and two separate rear portions with tubular cross-section covering rearward portions of said frame and said folded net; and

a handle assembled from two mating, identical pieces, said handle firmly holding said short ends of said frame by the clamping action of easily actuated fasteners projecting through both said mating pieces, said fasteners held non-rotatably by contoured recesses in said mating pieces, and said mating pieces having interlocking projections and mating recesses on the end of said handle opposite said fasteners.

5. A method for increasing the collection efficiency of a collecting net apparatus used to collect debris from a pool surface comprising:

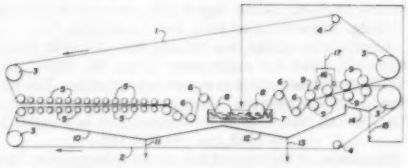
disposing an open-ended inner net within a closed outer net to form a composte net structure, said closed outer net passing outwardly of a planar, ovate frame, said frame being symmetrical about the short or longitudinal axis and having a transverse axis substantially longer than said short axis, said closed outer net folding inwardly over said frame to form a re-entrant, open-ended inner cylinder, said inner cylinder tapering so that the end of said inner cylinder opposite said frame is smaller in perimeter than said outer cylinder and said inner cylinder is shorter than said outer cylinder, said inner and outer cylinders being loosely secured to said frame by a seam adjacent to and parallel to said frame, both of said cylinders depending perpendicularly therefrom such that said inner net allows easy ingress of debris into said closed outer net upon forward motion of the composite net structure but retards egress of said debris from said closed outer net when the direction of motion of said composite net structure is reversed; and

applying a flexible, cover-blade over the arcuate forward portion of said ovate frame and extending far enough beyond each end of said arcuate section to cover the angular ends of said frame, said cover-blade having a sharp but moderately flexible forward edge which is parallel to and in the same plane as said frame and which flexibly adjusts to the contour of the pool surface being cleaned so that, upon forward motion of said collecting net apparatus across said pool surface to collect said debris, debris adhering to said pool surface is scraped off, thus facilitating ingress of debris into said collecting net apparatus.

4,481,118
METHOD AND APPARATUS FOR RINSING FILTER CAKE

Otto Heissenberger, Graz; Franz Petschauer, Lannach, and Johann Sbaschnigg, Graz, all of Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz-Andritz, Austria

Filed Nov. 3, 1982, Ser. No. 438,720
Claims priority, application Austria, Mar. 1, 1982, 758/82
Int. Cl.³ B01D *33/04*
U.S. Cl. 210—783 **16 Claims**



1. The method of rinsing filter cake compressed between a pair of opposed belts travelling in the same direction between first and second rollers comprising the steps of:

(a) exposing the filter cake to a solvent while said belts and filter cake are travelling between said first and second rollers;

(b) substantially relieving the pressure exerted on said filter

cake by said opposed belts while said belts and said filter cake are between said first and second rollers; and

(c) re-applying pressure on said filter cake with said opposed belts after said belts pass said second roller.

4,481,119

COMPOSITIONS FOR EXTINGUISHING TITANIUM FIRES

Robert A. Rhein; James C. Baldwin, and Charles L. Beach, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 11, 1983, Ser. No. 474,414

Int. Cl.³ A62D *1/00*

U.S. Cl. 252—2 **3 Claims**

1. A method of extinguishing a titanium metal fire in a flowing airstream comprising the step of:

injecting an extinguishant selected from the group consisting of calcium fluoride, lithium fluoride and sodium fluoride into the airstream at a point upstream of said fire.

4,481,120

HIGH TEMPERATURE STABLE AQUEOUS BRINE FLUIDS VISCOSIFIED BY N-HETEROCYCLIC ORGANOPHOSPHORUS COMPOUNDS

Israel Heilweil, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,625

Int. Cl.³ C09K *7/00, 3/00*

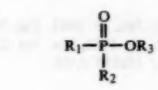
U.S. Cl. 252—8.5 A **13 Claims**

1. A viscosified brine fluid comprising:

(i) water;

(ii) at least about 30% by weight of salt; and

(iii) a viscosity increasing amount of a brine tolerant N-heterocyclic organophosphorus compound of the formula



(I)

where

R_1 is O^-, $O^-M_1^+$, OH or OR_4;

R_2 is O^-, $O^-M_2^+$, OH or OR_5;

R_3 is an organic moiety having at least one positively charged N-heterocyclic moiety;

R_4 and R_5 are the same or different organic moieties; and

M_1^+ and M_2^+ are the same or different cations.

4,481,121

VISCOSIFIER FOR OIL BASE DRILLING FLUIDS

Horst K. F. Barthel, Suessen, Fed. Rep. of Germany, assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 379,199, May 17, 1982, abandoned. This application Jun. 4, 1984, Ser. No. 617,141

Int. Cl.³ C09K *7/06*

U.S. Cl. 252—8.5 M **6 Claims**

1. An oil base drilling fluid composition, comprising:

an oil base fluid present in the range of about 95 to 75 percent by volume of the drilling fluid composition;

montan wax having a melting point in the range of about 76° to 120° and an acid number and a saponification number greater than about 100, said montan wax being present in the range from about 5 to 20 pounds per barrel of drilling fluid composition;

a basic material selected from the group consisting of diethanolamine, alkali metal hydroxides, alkaline earth oxides, and alkaline earth hydroxides capable of forming a soap with said montan wax;

water present in the range of about 5 to 25 percent by volume of the drilling fluid composition; and

said oil base drilling fluid composition being characterized by the substantial absence of any dispersed asphalt.

4,481,122

LUBRICANT COMPOSITIONS

Jon C. Root, Leawood; John F. Barnes, and Dennis M. Rosson, both of Olathe, all of Kans., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,014

Int. Cl.³ C10M *5/10*

U.S. Cl. 252—32.7 E **5 Claims**

1. A lubricant grease composition for use in lubricating traction motor gears employed in Diesel locomotives, comprising: about 80% to about 96% by weight of a mineral oil having a viscosity of about 140 to about 225 SUS at 210° F.; about 5% to about 20% by weight of an oil soluble polymer having a molecular weight of about 5000 to about 140,000 Staudinger; about 1% to about 10% by weight of a metal substituted dialkyl- or diaryl-dithiophosphate, or a metal substituted dialkydithiocarbamate, or an aromatic amine about 0.1% to about 2% by weight of a polymethylacrylate or alkylated styrene pour depressant; and about 0.001% to about 1% by weight of an organosilicone antifoaming agent; said composition being in the form of a grease having extreme pressure properties which enable it to remain stable after prolonged use at the high pressures and temperatures encountered in traction motor gears of Diesel locomotives, and being capable of providing excellent lubrication at freezing or below freezing termperatures.

4,481,123

POLYETHERS, THEIR PREPARATION AND THEIR USE AS LUBRICANTS

Karl-Heinz Hentschel; Rolf Dhein, both of Krefeld; Siegfried Kussi, Leverkusen; Hans Winter, and Herbert Vojacek, both of Munich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 371,031

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117841; May 6, 1981, 3117839; May 6, 1981, 3117840; Mar. 20, 1982, 3210283

Int. Cl.³ C10M *1/28*

U.S. Cl. 252—52 R **24 Claims**

1. A polyether obtained by polymerization of an α-alkylene oxide, said α-alkylene oxide having an alkylene radical which contains 8 to 26 carbon atoms, and a tetrahydrofuran in the presence of a hydroxy compound of the formula

wherein R^1 denotes hydrogen, an alkyl radical having 1 to 4 carbon atoms or a hydroxy-alkyl radical having 2 to 40 carbon atoms, said polymerization conducted in the presence of a polymerization initiator comprising a Lewis acid selected from the group consisting of boron trifluoride, boron trifluoride diethyl etherate, boron trifluoride tetrahydrofuranate, aluminum chloride, iron (III) chloride, tin (IV) chloride, titanium tetrachloride, tin chloride and antimony pentachloride, said polyether having a molecular weight of 40 to 10,000 and a kinematic viscosity at 40° C. of 5 to 3,000 mPa.s.

17. A lubricant composition comprising a major amount of a polyether according to claim 1 and a diluent.

24. A lubricant comprising a major amount of an oil of lubricating viscosity and a minor amount of a polyether according to claim 1.

4,481,124
THERMAL SHOCK RESISTANT POROUS SOUND ABSORBING BODY

Shosuke Koga, Owariasahi; Mitsuru Koketsu, Nagoya; Yoshihiro Ohta, Nagoya, and Seigo Satomi, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jan. 7, 1983, Ser. No. 456,356
Int. Cl.³ C04B *43/00*; E04B *1/74*
U.S. Cl. 252—62 **23 Claims**

1. A thermal shock resistant porous sound absorbing body comprising:

ce ramic particles, approximately 100 parts by volume, having a bulk density between 1.2 g/cm³ and 2.0 g/cm³, a grain size distribution between 0.3 mm and 4.0 mm, a thermal expansion coefficient of less than 70×10^{-7}/°C. and a fire resistant temperature greater than 1,000° C.;

an inorganic binder, approximately 4 to 18 parts by volume, having a melting temperature lower than a melting temperature of the ceramic particles and a thermal expansion coefficient lower than the thermal expansion coefficient of the ceramic particles, the inorganic binder forming a matrix portion substantially around and substantially between the ceramic particles, resulting in the sound absorbing body having a 35 to 45 volume percent porosity.

4,481,125
WATER-BASED HYDRAULIC FLUID

Rosauro V. Holgado, Bala-Cynwyd, Pa., assignor to E.F. Houghton & Co., Valley Forge, Pa.

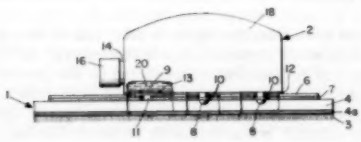
Continuation-in-part of Ser. No. 374,157, May 3, 1982, abandoned. This application Jun. 29, 1983, Ser. No. 508,831
Int. Cl.³ C10M *3/04, 1/06*
U.S. Cl. 252—75 **56 Claims**

1. A high water-based hydraulic fluid in the form of an oil-in-water emulsion comprising (1) from about 1.5 to about 15% of a polyether-based thickener, (2) from about 0.5 to about 20% of a lubricant modifier (3) from about 0.5 to about 5.0% of a dispersing agent which is the reaction product of an alkenyl succinic anhydride or acid and a water soluble active hydrogen compound, (4) from about 0.125 to about 1.25% of an extreme pressure additive comprising a dialkyl or diaryl dithiophosphate, or a dialkyl or diaryl dithiocarbamate, and (5) balance water, said percentages being by weight based on the total weight of the fluid.

4,481,126
NO RINSE LIQUID CAR CLEANER WITH SOLID POLYMERS

Toan Trinh, Maineville, and John S. Scheper, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 26, 1982, Ser. No. 401,578
Int. Cl.³ C11D *3/37*
U.S. Cl. 252—174.23 **34 Claims**



1. A liquid car cleaner composition comprising:

I. from 0.1% to 30% by weight of a mixture of organic polymeric solids selected from the group consisting of:

A. polymeric particles of particle size in the range of from 1 micron to about 250 microns;

B. polymeric fibers of diameter between 1 micron and 50 microns, and length between 0.1 millimeter to 3 millimeters;

said A and B having a weight ratio of 20:1 to 1:1; said composition having a maximum of 10% of said fibers;

II. from 20% to about 95% of a liquid carrier for said particles, wherein said liquid carrier contains from about 10% to 90% by weight of the composition of an aliphatic hydrocarbon solvent;

III. an organic suspending agent in sufficient amount ot suspend said particles in said liquid carrier; and

IV. from 0.1% to 20% by weight of silicone.

4,481,127
POLYOL BLENDS

Robert P. Yeater, Moundsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 5, 1983, Ser. No. 520,663
Int. Cl.³ C09K *3/00*; H05B *33/00*
U.S. Cl. 252—182 **4 Claims**

1. A polyol blend comprising:

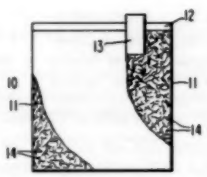
(a) from about 5 to about 30% by weight of a member selected from the group consisting of 1,4-butanediol, ethylene glycol, and mixtures thereof, and

(b) from about 70 to about 95% by weight of a polyester polyol produced by reacting from 10 to 60 parts by weight of adipic acid with from 40 to 90 parts by weight of a polyoxyethylene glycol having a molecular weight of from 150 to 680, the parts of adipic acid and polyoxyethylene glycol being 100, and wherein said polyester has an hydroxyl number of from about 25 to about 130 and an acid number of 2 or less.

4,481,128
ALKALI SLURRY OZONATION TO PRODUCE A HIGH CAPACITY NICKEL BATTERY MATERIAL

John F. Jackovitz, Monroeville, and Earl A. Pantier, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 229,360, Jan. 29, 1981, Pat. No. 4,330,603. This application Mar. 10, 1982, Ser. No. 356,687
Int. Cl.³ H01M *4/88*
U.S. Cl. 252—182.1 **4 Claims**



1. A method of making a high capacity battery material comprising the steps:

(A) providing a slurry of hydrated $Ni(OH)_2$, containing alkali metal cation selected from the group consisting of potassium cation, sodium cation and lithium cation, formed by treatment of a nickel compound selected from the group consisting of $NiSO_4$ and $Ni(NO_3)_2$ with a molar excess of an alkali material selected from the group consisting of potassium hydroxide, sodium hydroxide, lithium hydroxide, potassium carbonate and sodium carbonate and then washing with water, to provide a slurry having a pH of between about 6.5 and 12.0, and

(B) contacting the slurry with an ozone-air or ozone-oxygen gas mixture at a flow rate of between about 25 cc./min. and about 1,000 cc./min. for each liter of alkali metal containing slurry, at a pressure between about 3 psig. and about 20 psig., for a time effective to form an ozonated material consisting essentially of:

(a) about 60 wt.% to about 95 wt.% of hydrated $Ni(OH)_2$, and

(b) about 5 wt.% to about 40 wt.% of Ni(IV) hydrated oxide interlayer doped with alkali metal cation selected from the group consisting of potassium cation, sodium cation, and lithium cation, where the cation in the interlayer of the Ni(IV) hydrated oxide is the same as the cation contained in the slurry of hydrated $Ni(OH)_2$.

4,481,129

BLEACH COMPOSITIONS

John Oakes, South Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,103

Claims priority, application United Kingdom, Dec. 23, 1981, 8138829

Int. Cl.³ C11D *7/54, 3/395;* **D06L** *3/02*

U.S. Cl. 252—186.41 **10 Claims**

1. A bleach composition having an improved bleach performance at substantially all temperatures, comprising a peroxide compound selected from the group of hydrogen peroxide and inorganic persalts which liberate hydrogen peroxide in aqueous solution, a manganese compound which delivers manganese (II) ions in aqueous solution in an amount of 0.005 to 5% by weight of manganese (II), and a carbonate compound which delivers carbonate ions in aqueous solution in an amount of 1 to 50% by weight of carbonate ions.

4,481,130

METHOD FOR DEMULSIFYING WATER-IN-OIL EMULSIONS

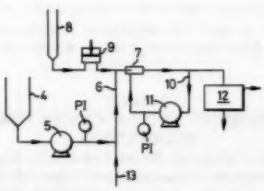
David S. Robertson, Ashford, England, assignor to The British Petroleum Company Limited, London, England

Filed Jun. 7, 1982, Ser. No. 386,111

Claims priority, application United Kingdom, Jun. 24, 1981, 8119466

Int. Cl.³ B01D *17/04*

U.S. Cl. 252—328 **6 Claims**



1. A method for demulsifying a water-in-oil emulsion, which emulsion comprises 50 to 80% by volume of water as the dispersed phase, comprising passing the water-in-oil emulsion and a chemical demulsifier through a mixing device having at least one flow restriction and recycling part of the mixture leaving the mixing device back to the device at, or upstream of the restriction, the ratio of the recycle flowrate to the flowrate of the emulsion and demulsifier being from 1:1 to 10:1.

4,481,131

ELECTROCONDUCTIVE RESIN COMPOSITION

Yoichi Kawai; Yoshihisa Gotoh, both of Yokohama; Masami Maki, Kawasaki; Sachio Yokote, Yokohama; Katsumi Sekiguchi, Tokyo; Katsuyoshi Sasagawa, and Masao Imai, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 347,997

Claims priority, application Japan, Mar. 2, 1981, 56-28413; Sep. 21, 1981, 56-147972; Nov. 6, 1981, 56-177080

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 **6 Claims**

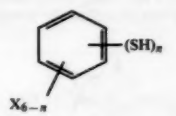
1. An electroconductive polypropylene-type resin composition comprising:

(1) 100 parts by weight of a resin selected from the group consisting of a propylene homopolymer, an ethylene-propylene copolymer, an ethylene-propylene random copolymer rubber, an ethylene-propylene non-conjugation diene copolymer rubber and a blend of two or more of said polymers;

(2) 10 to 60 parts by weight of carbon black,

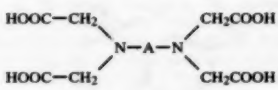
(3) 0.1 to 6 parts by weight sulfur, and

(4) at least 0.1 part by weight of one or two accelerators selected from the group consisting of (i) thiophenol derivatives of the formula:



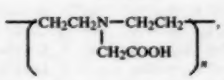
(1)

wherein X represents a hydrogen atom, a halogen atom, or a lower alkyl group and n represents an integer of 1 to 3, (ii) metal complexes of said thiophenol derivatives with at least one metal selected from the group consisting of iron, magnesium and zinc, and (iii) compounds of the formula:



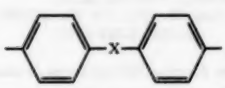
(2)

wherein A represents any one of:



(a)

and



(b)

in which X represents an oxygen or sulphur atom, or methylene, imino or sulfuryl group.

4,481,132
HIGH STABILITY CONDUCTIVE POLYACETYLENE MATERIAL AND PROCESS FOR THE PRODUCTION THEREOF

Jean C. Dubois; Maryse Gazard; Francois Schue; Louis Giral; Michel Rolland, and Mahmoud Aldissi, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 6, 1982, Ser. No. 395,294
Claims priority, application France, Jul. 3, 1981, 81 13157
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—519 **8 Claims**

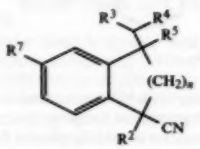
1. A conductive polyacetylene material with a high thermal stability and stability to oxygen, wherein said polyacetylene material is doped with a dopant constituted by a salt in chloride form of an element belonging either to the transition metals selected from the group consisting of chrome, nickel, iron, titanium, tungsten and molybdenum or to the lanthanides selected from the group consisting of europium and ytterbium.

4,481,133
ODORANT AND/OR FLAVORANT SUBSTANCES

Hans U. Gonzenbach, and Paul A. Ochsner, both of Geneva, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 175,789, Aug. 6, 1980, Pat. No. 4,406,828.
This application Jan. 10, 1983, Ser. No. 456,664
Claims priority, application Switzerland, Aug. 10, 1979, 7355/79; Jun. 30, 1980, 5003/80
Int. Cl.³ C11B *9/00*; C07C *121/64*
U.S. Cl. 252—522 R **13 Claims**

1. An odorant and/or flavoring composition comprising an effective amount of a compound of the general formula



I

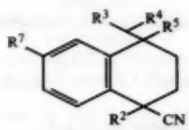
wherein:

R^2 through R^5 and R^7 represent hydrogen or methyl; and

n stands for 1 or 2

and at least one other odorant and/or flavorant compound.

9. A compound having the formula



wherein: R^2 through R^5 and R^7 represent hydrogen or methyl.

4,481,134
METHOD FOR FORMING MICROSPHERES FOR ENCAPSULATION OF NUCLEAR WASTE

Peter Angelini, Oak Ridge; Anthony J. Caputo; Richard E. Hutchens, both of Knoxville; Walter J. Lackey, Oak Ridge, and David P. Stinton, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

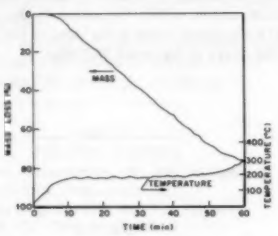
Filed Jan. 29, 1982, Ser. No. 343,803
Int. Cl.³ G21F *9/16*
U.S. Cl. 252—628 **4 Claims**

1. A method for forming microspheres containing nuclear waste, comprising:

contacting droplets containing said nuclear waste with a gelation liquid to gel said droplets;

placing the droplets which have been contacted with said gelation liquid in a furnace without washing said gelation liquid therefrom; and

drying and then calcining the unwashed gelled droplets in



said furnace while adjusting the humidity or temperature in the furnace so as to remove from said droplets up to about 75% by weight of the water and other volatile material therein at a substantially linear mass loss rate.

4,481,135
PROCESS FOR THE TREATMENT OF BASIC AQUEOUS EFFLUENTS

Alain Aspart, Paris; Bernard Guillaume, Grigny, and Jean-Paul Moulin, Bois d'Arcy, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jun. 17, 1982, Ser. No. 389,281
Claims priority, application France, Jun. 24, 1981, 81 12408
Int. Cl.³ G21F *9/08*
U.S. Cl. 252—632 **8 Claims**

1. A process for the treatment of basic aqueous effluents containing in dissolved form one or more members selected from the group consisting of plutonium and mixtures of plutonium and uranium, wherein the effluents are basic aqueous solutions concentrated by evaporation under reduced pressure at a temperature such that precipitation of the plutonium is substantially avoided.

4,481,136
ALKYL SUBSTITUTED FLUORESCENT COMPOUNDS AND CONJUGATES

Pyare Khanna, Mountain View, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 73,158, Sep. 7, 1979, Pat. No. 4,351,760.
This application Jul. 19, 1982, Ser. No. 399,506
Int. Cl.³ A61K *39/385*; C07G *7/00*
U.S. Cl. 260—112 R **14 Claims**

1. 2,7-Dialkylsubstituted-9-substituted xanthen-6-hydroxy-3H-3-one covalently linked to a heteroatom of an organic compound of at least 125 molecular weight, said covalent linking being from the 2 or 9 position of said xanthenone.

4,481,137
GLYCOPROTEINS AND PROCESSES FOR THEIR PRODUCTION

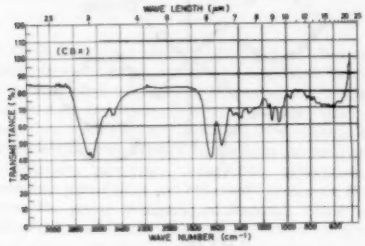
Haruo Ohnishi, Funabashi; Kazuo Yamaguchi, Koganei; Yasuo Suzuki, Kawaguchi; Ei Mochida, and Nobuo Mochida, both of Tokyo, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

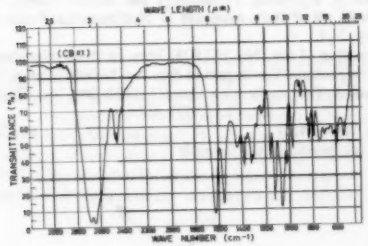
Filed Feb. 18, 1983, Ser. No. 467,840
Claims priority, application Japan, Feb. 26, 1982, 57-28992; Feb. 26, 1982, 57-28993; May 24, 1982, 57-87674; May 24, 1982, 57-87675; Jun. 23, 1982, 57-108046
Int. Cl.³ C07G *7/00*
U.S. Cl. 260—112 R **60 Claims**

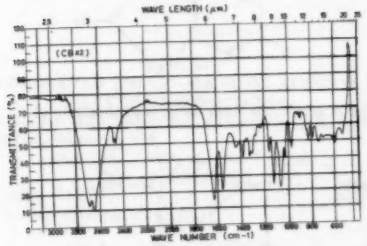
1. A substantially purified form of a glycoprotein (CB_X) produced from non-established cells or cells of established cell

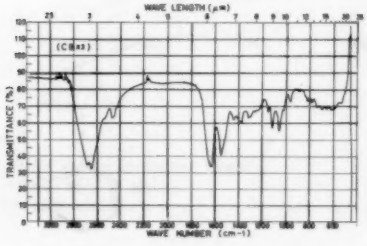
lines of reticulo-endothelial cells, lymphoblasts, leukemia cells or fibroblasts originated from warm-blooded animals, having an anti-tumor effect and having the following properties:

(a) molecular weight: 12,000–17,000;









(b) color reactions: it exhibits a color indicating proteins in the Lowry reaction, exhibits a color indicating peptide bonds and amino acids in the ninhydrin reaction after hydrolysis with hydrochloric acid, and exhibits a color indicating sugars in the phenol-sulfuric acid reaction, the anthrone-sulfuric acid reaction, the indole-sulfuric acid reaction and the tryptophane-sulfuric acid reaction;

(c) appearance and solubility: white powder soluble in water, aqueous sodium chloride and phosphate buffer, and sparingly soluble in benzene, hexane and chloroform;

(d) sugar content: sugar content is 27–33%, 17–20% of the total sugar being hexoses, 5–7% being hexosamines and 5–6% being sialic acids;

(e) isoelectric point: 4.2–7.3;

(f) adsorbability: adsorbable on Ulex europeus agglutinin-conjugated Sephadex in 0.01M phosphate buffer (pH 7.2);

(g) stability: stable in an aqueous solution of pH 2.0, pH 7.0 or pH 11.0 at 4° C. for 24 hours or longer and in an aqueous solution of pH 7.0 at 60° C. for 3 hours or longer;

(h) cytotoxicity: it selectively damages tumor cells without substantially damaging normal cells; and

(i) differentiation: induces differentiation of tumor cells.

4,481,138

HEPTADECAPEPTIDE

Shinro Tachibana; Kengo Araki, both of Kashiwa; Shizuko Ohya, Ushikumachi, and Seiji Yoshida, Urayasu, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,324

Claims priority, application Japan, Jul. 21, 1981, 56-112950

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. A heptadecapeptide having the following primary amino acid structure:

Tyr—Gly—Gly—Phe—Leu—Arg—Arg—Ile—Arg—Pro—Lys—Leu—Lys—Trp—Asp—Asn—Gln.

4,481,139

PEPTIDE ANTAGONISTS OF SUBSTANCE P

Karl Folkers, Austin, Tex., and Xu Jie-cheng, Shanghai, China, assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Apr. 13, 1983, Ser. No. 484,646

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **7 Claims**

1. [D-Arg[1],D-Trp[7],D-Trp[9],Leu[11]]-Sp.

4,481,140

PROCESS OF SULFURIZING LARD OIL AND AN OLEFIN AND RESULTANT PRODUCT

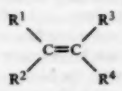
Alexander D. Recchuite, Boothwyn, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

Continuation-in-part of Ser. No. 135,466, Apr. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 116,985, Feb. 19, 1971, Pat. No. 3,825,495. This application Jan. 24, 1972, Ser. No. 220,399

Int. Cl.³ C09B *49/00*; C10M *1/38, 3/32*

U.S. Cl. 260—399 **9 Claims**

1. A sulfurized composition of matter prepared by blending together a triglyceride wherein the fatty acid moieties of said triglyceride contain principally from 9 to 22 carbon atoms and at least about 45 mole percent of the fatty acid moieties present in said triglyceride contain at least one ethylenically unsaturated carbon-carbon double bond and wherein said fatty acid moieties are hydrocarbons except for the carboxyl group of said fatty acid moieties, with an olefinic hydrocarbon containing from 2 to about 24 carbon atoms and having the structure



wherein R^1, R^2 and R^3 are either hydrogen or alkyl and R^4 is either hydrogen, alkyl, aryl, cycloalkyl or alkaryl, to form a

blend comprising said triglyceride and said hydrocarbon, the ratio of said hydrocarbon to said triglyceride being in the range from about 50 parts by volume of said hydrocarbon per 50 parts by volume of triglyceride to about 10 parts by volume of said hydrocarbon per 90 parts of triglyceride, and additionally comprising free fatty acids in amount from 2 to 20 weight percent based upon the total of triglyceride and free fatty acids, and reacting the blend with sulfur to obtain a sulfurized blend containing 7.5 to 25 percent by weight of sulfur based on the blend of triglyceride and olefin.

4,481,141

NONDIFFUSIBLE YELLOW METALLIZED AZO DYE-RELEASING COMPOUNDS

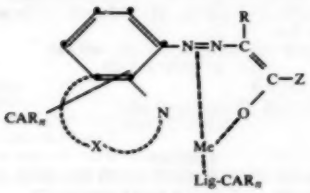
Steven Evans, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 392,509, Jun. 28, 1982, Pat. No. 4,407,931. This application Apr. 14, 1983, Ser. No. 484,806

Int. Cl.³ C09B *45/10, 45/12, 45/20, 45/22*

U.S. Cl. 534—700 **19 Claims**

1. A nondiffusible compound having at least one diffusible yellow dye moiety or precursor thereof, said compound having the formula:



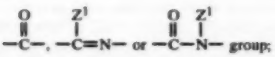
wherein:

(a) X represents the atoms necessary to complete a 5- or 6-membered aromatic heterocyclic fused ring;

(b) Z represents alkyl, substituted alkyl, aryl or substituted aryl;

(c) R represents CN or J-L;

(d) J represents a bivalent



(e) L represents alkyl, substituted alkyl, aryl, substituted aryl, or taken together with Z completes a carbonyl-containing 5- or 6-membered heterocyclic or carbocyclic ring;

(f) Z^1 represents the same groups as Z;

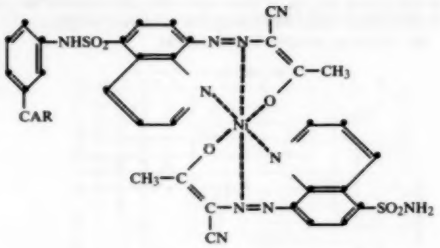
(g) each CAR independently represents a ballasted carrier moiety which will release said diffusible yellow dye moiety or precursor thereof as a function of development of a silver halide emulsion layer under alkaline conditions;

(h) each n is 0 or 1, with the proviso that at least one n is 1;

(i) Lig is a monoanionic tridentate ligand; and

(j) Me is a polyvalent, hexacoordinate metal ion.

19. The compound of claim 1 which comprises:



4,481,142

PYRIMIDO-2-BENZAZEPINES

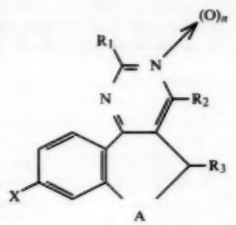
Rodney I. Fryer, North Caldwell; Norman W. Gilman, Wayne; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 151,025, May 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 16,709, Mar. 1, 1979, abandoned. This application Oct. 27, 1982, Ser. No. 437,047

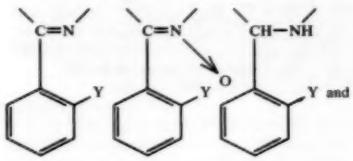
Int. Cl.³ C07D *487/04*

U.S. Cl. 260—243.3 **18 Claims**

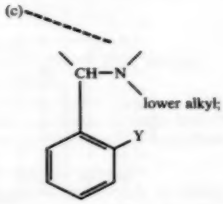
1. A compound of the formula



wherein A is selected from the group consisting of



(a) (b)



(d)

R^1 is selected from the group consisting of hydrogen, chlorine, bromine, lower alkyl, the group NR_4R_5, the group —CH_2—CO— R_7, the group —$NH(CH_2)_mNR_8R_9$, hydroxy, lower

alkoxy, mercapto and lower alkyl mercapto; R_2 is hydrogen; R_3 is selected from the group consisting of hydrogen, the radical of the formula

wherein R is lower alkyl or hydrogen and hydroxy; X is selected from the group consisting of hydrogen, halogen, trifluoromethyl, ethyl, α-hydroxy ethyl and acetyl; Y is hydrogen or halogen; R_4 and R_5 are hydrogen or lower alkyl or together with their co-bonded nitrogen atom form a five to seven membered heterocyclic group selected from the group consisting of morpholino, piperidino, 3-pyrrolino, piperazino, azetidino, aziridino, pyrrolidino and hexamethyleneimino; R_7 is selected from the group consisting of hydroxy, lower alkoxy and NR_8R_9; R_8 and R_9 are hydrogen or lower alkyl; n is 0 or 1 and m is 1 to 7 with the limitation that (1) when R_3 is the radical

or hydroxy, A is the group (a), X is hydrogen, halogen, trifluoromethyl, ethyl or acetyl and R_1 is the group $—NH(CH_2)_mNR_8R_9$, then R_8 and R_9 are lower alkyl, (2) when A is group (d) and R_1 is the group $—NH(CH_2)_mNR_8R_9$, then R_8 and R_9 are lower alkyl and (3) when n is 1, R_1 is hydrogen, lower alkyl, lower alkoxy, chlorine, bromine or the group $—CH_2—CO—R_7$ with R_7 as above, then A is the group (a) or (b) and the pharmaceutically acceptable salts thereof.

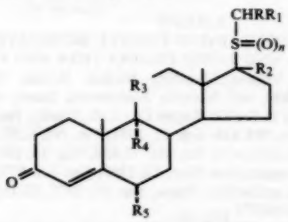
4,481,143
Patent Not Issued For This Number

4,481,144
17-SUBSTITUTED THIA-17-ALKYL(OR ALKENYL OR ALKYNYL)ANDROSTENES

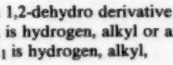
Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 3, 1984, Ser. No. 576,668
Int. Cl.³ C07J *5/00*
U.S. Cl. 260—397.45 **24 Claims**

1. A steroid having the formula



or a 1,2-dehydro derivative thereof, wherein
R is hydrogen, alkyl or aryl;
R_1 is hydrogen, alkyl,



alkylthio, alkoxy, fluoro, hydroxyalkyl, cyanoalkyl, alkoxycarbonyl—$(CH_2)_p$—, mono-, di- or trifluoroalkyl or

wherein p is 0, 1, 2, 3, or 4, Y_1 is alkyl or aryl, and Y_2 and Y_3 are the same or different and each is hydrogen or alkyl;
R_2 is alkyl, alkenyl or alkynyl;
R_3 is carbonyl or β-hydroxymethylene;
R_4 is hydrogen or halogen;
R_5 is hydrogen, methyl or fluorine; and
n is 0, 1 or 2.

4,481,145
DISPROPORTIONATION OF UNSATURATED ACIDS

Donald G. Timms, Hilly Ground, England, assignor to Enichem Elastomers Limited, Southhampton, England

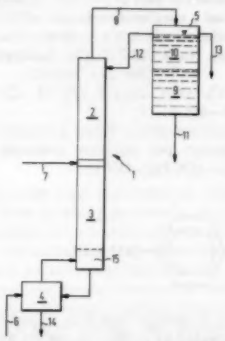
Filed Jan. 31, 1983, Ser. No. 462,451
Claims priority, application United Kingdom, Feb. 1, 1982, 8202844
Int. Cl.³ C09F *1/04, 7/08*
U.S. Cl. 260—405.6 **8 Claims**

1. A process for the disproportionation of rosin acids by heating with a catalyst comprising iodine and an iron compound characterised by the use of ammonia, an ammonium salt or urea, dimethyl urea, tetramethyl urea, ethylene diamine, diethylene triamine, or an alkanolamine as an additional component of the catalyst.

4,481,146
PROCESS FOR THE PREPARATION OF AN ETHYL ESTER

Ernst I. Leupold, Neu-Anspach; Hans-Joachim Schmidt, Königstein, and Knut Popp, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,877
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037158
Int. Cl.³ B01D *3/14;* C11C *3/02;* C07C *67/02*
U.S. Cl. 260—410.9 R **2 Claims**



1. A process for the preparation of an ethyl ester from an ethanol containing mixture of aliphatic alcohols, which comprises:
feeding a mixture of aliphatic alcohol to distillation column at a point located in the sump portion of said distillation column;
feeding carboxylic acid to the distillation column at a point located near the middle of said distillation column;
esterifying in said distillation column said mixture of aliphatic alcohol with said carboxylic acid at a molar ratio of from 1.1:1 to 2.0:1 acid to alcohol in the presence of an acid catalyst to form water and a mixture of esters containing ethyl ester and heavier esters;
continuously separating the ethyl ester so formed in the distillation column from said mixture of esters;

continuously withdrawing the water and ethyl ester formed through the upper portion of said distillation column; and continuously withdrawing the heavier esters formed through the sump of said distillation column.

4,481,147

PROCESS FOR PREPARING ALKYLESTERS OF SATURATED ALIPHATIC CARBOXYLIC ACIDS

Peter Hofmann, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 125,482, Feb. 28, 1980, abandoned. This application Jul. 11, 1983, Ser. No. 512,322

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912489

Int. Cl.[3] **C11C** *3/02;* **C09F** *5/08*

U.S. Cl. 260—410.9 R **20 Claims**

1. A process for preparing more than about 72% linear alkylesters of saturated aliphatic carboxylic acids consisting essentially of reacting aliphatic monoolefins having 6 to 20 carbon atoms containing 50–100% by weight of said monoolefins having internal double bonds with carbon monoxide and a lower aliphatic alkanol having one hydroxyl function in the presence of a catalyst consisting of a cobalt compound selected from the group consisting of cobalt carbonyls, carboxylic acid salts of cobalt, cobalt carbonates and cobalt oxides and a promoter selected from the group consisting of pyridine and non-ortho lower alkyl substituted pyridine and mixtures thereof at a temperature of about 165° to 195° C., a pressure of about 150 to 300 bars, a dwell time in excess of 15 minutes, a promoter to cobalt ratio of about 3/1 to 25/1 where the promoter is measured in gram-atoms of cobalt, a cobalt concentration from about 0.02 to 0.2 gram-atoms of cobalt per mole of monoolefin, and a molar ratio of alkanol to monoolefin of about 1/1 to 10/1.

4,481,148

HYDROXYL CONTAINING LIQUID POLYMERS

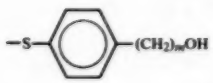
Changkiu K. Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 45,899, Jun. 6, 1979, abandoned, and a continuation-in-part of Ser. No. 931,234, Aug. 7, 1978, abandoned, which is a division of Ser. No. 782,104, Mar. 28, 1977, Pat. No. 4,120,766. This application Mar. 16, 1981, Ser. No. 244,525

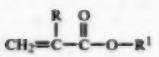
Int. Cl.[3] **C07C** *121/28, 121/66, 121/36, 149/18*

U.S. Cl. 260—465.4 **20 Claims**

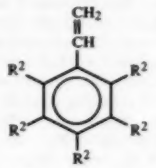
1. Hydroxyl containing liquid polymers having 2 terminal hydroxyl groups per polymer molecule of the structure —S—$(CH_2)_n$—$(OCH_2)_m$OH or



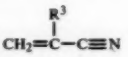
wherein m is an integer from 0 to 10 and n is an integer from 1 to 10, connected by carbon to carbon linkages consisting of polymerized units of vinylidene monomers having at least one terminal $CH_2{=}C<$ group in amount of 60 to 100 percent by weight of said vinylidene monomers selected from the group consisting of (a) monoolefins containing 2 to 14 carbon atoms, (b) dienes containing 4 to 10 carbon atoms, (c) vinyl alkyl ketones wherein the alkyl radical contains 1 to 8 carbon atoms, (d) vinyl and allyl alkyl ethers wherein the alkyl radicals contain 1 to 8 carbon atoms and (e) acrylic acids and acrylic acid esters of the formula



wherein R is hydrogen, alkyl or hydroxyalkyl, wherein said alkyl or hydroxyalkyl contain 1 to 3 carbon atoms and wherein R^1 is hydrogen, alkyl, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl or cyanoalkyl wherein said alkyl or hydroxyalkyl contain 1 to 18 carbon atoms and wherein said alkoxyalkyl, alkylthioalkyl or cyanoalkyl contain 2 to 8 carbon atoms; and 0 to 40 weight percent of at least one vinylidene comonomer selected from the group consisting of vinyl aromatics of the formula



wherein R^2 is hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or hydroxyalkyl containing 1 to 4 carbon atoms; alpha methyl styrene; vinyl nitriles of the formula



wherein R^3 is hydrogen or alkyl containing 1 to 3 carbon atoms; acrolein; methacrolein; divinyl benzene; divinyl ether; diethylene glycol diacrylate; diethyl fumarate; diethyl maleate; acrylamide; methacrylamide; N-methylol acrylamide, methallyl chloride; itaconic acid; vinyl halide; vinyl acetate; vinyl propionate; vinyl benzoate; vinyl chloroacetate; allyl chloroacetate; vinyl crotonate; vinyl cyclohexane; vinyl ethyl fumarate; allyl acetate; nitro styrene; methoxy styrene; chloroprene; vinyl naphthalene; vinyl piperidine; vinyl pyridine; N-vinyl pyrrolidine; vinyl stearate; vinyl sulfanilic acid; methyl vinyl sulfone; vinylidine cyanide; chloroethyl vinyl ether; vinyl benzyl chloride; chloroethyl acrylate; bromopropyl acrylate; beta-chloroethyl vinyl phosphonate and diacetone acrylamide.

4,481,149

FLUORINE-CONTAINING PHENYL BENZOATE COMPOUNDS, AND THEIR PRODUCTION AND USE

Susumu Misaki, Minoo; Masahiro Suefuji, Settsu; Tamio Mitote, Kawanishi, and Naotake Matsumura, Itami, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

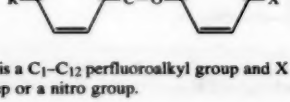
Division of Ser. No. 301,128, Sep. 11, 1981, Pat. No. 4,393,231, which is a continuation of Ser. No. 75,686, Sep. 14, 1979, abandoned. This application Mar. 23, 1983, Ser. No. 477,899

Claims priority, application Japan, Sep. 19, 1978, 53-115447; Nov. 21, 1978, 53-144571

Int. Cl.[3] **G09K** *3/34;* **C02F** *1/13;* **C07C** *69/76, 79/32, 121/52*

U.S. Cl. 260—465 D **11 Claims**

1. A compound of the formula:



wherein R is a C_1–C_{12} perfluoroalkyl group and X is a alkyl a cyano group or a nitro group.

4,481,150
PROCESS FOR PREPARING HYDROXYALKYLAMINOSULFONIC ACIDS

Keizou Ishii; Ryuzo Mizoguchi; Shinichi Ishikura, and Tamotsu Yoshioka, all of Ikedanaka, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 214,434, Dec. 8, 1980, abandoned. This application Aug. 27, 1982, Ser. No. 412,977
Int. Cl.³ C07C *143/02*
U.S. Cl. 260—513 N 4 Claims

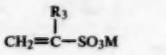
1. A process for preparing a hydroxyalkylaminosulfonic acid which comprises

reacting a hydroxyalkylamine of the formula:

(II)

wherein

R_1 is C_1–C_{20} hydroxyalkyl optionally containing —O— or —COO— in the alkyl chain, and R_2 is hydrogen, C_1–C_{20} hydroxyalkyl optionally containing —O— or —COO— in the alkyl chain, or lower alkyl, with an alkali metal salt of an α,β-unsaturated sulfonic acid of the formula:

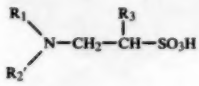


(III)

wherein

R_3 is hydrogen or methyl, and M is an alkali metal, in a solvent consisting of water at 0° to 90° C. under normal or elevated pressure, and

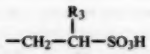
eliminating the alkali metal to give the hydroxyalkylaminosulfonic acid, of the formula:



(I)

wherein

R_1 and R_3 are each as defined above, and R_2' is hydrogen, C_1–C_{20} hydroxyalkyl optionally containing —O— or —COO— in the alkyl chain, lower alkyl or a group of the formula:



wherein

R_3 is as defined above.

4,481,151
PROCESS FOR THE PREPARATION OF DIALKYLPHOSPHINIC ACID HALIDES

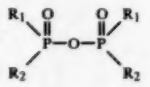
Hans-Jerg Kleiner, Kronberg/Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,422
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135666
Int. Cl.³ C07F *9/34*
U.S. Cl. 260—543 P 8 Claims

1. A process for the preparation of a dialkyl phosphinic acid halide of the formula

in which R_1 and R_2, independently from each other, are alkyl radicals having from 1 to 6 carbon atoms and X is a halogen atom, which comprises:

introducing hydrogen halide at a reaction temperature of from about 170° to 220° C. and at normal pressure into a dialkyl phosphinic anhydride of the formula



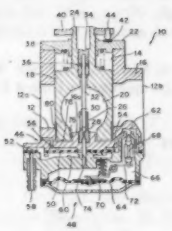
in which R_1 and R_2 have the same meaning as in the formula for the dialkyl phosphinic acid halide; and

distilling off at the reaction temperature the dialkyl phosphinic acid halide formed in the reaction.

4,481,152
ROTARY THROTTLE VALVE CARBURETOR

Hiroto Kobayashi, and Takeshi Kobayashi, both of Kawasaki, Japan, assignors to Walbro Far East, Inc., Kawasaki, Japan

Filed Dec. 6, 1982, Ser. No. 447,224
Claims priority, application Japan, Dec. 10, 1981, 56-197709
Int. Cl.³ F02M *9/08*
U.S. Cl. 261—35 2 Claims



1. In a rotary throttle type carburetor in which a rotary throttle, movable from an idling position to an open throttle position, is positioned in a bore transverse to an air hole having an inlet and outlet in a carburetor body with a throttle passage registering with said air hole, that improvement which comprises a constant pressure device mounted on said carburetor body having a constant pressure chamber directly below said rotary throttle, and a short straight fuel passage connecting said constant pressure chamber and said throttle passage, a fuel pump device mounted on said carburetor body between said body and said constant pressure device, said fuel passage extending through said fuel pump device to said throttle passage.

4,481,153
ROTARY THROTTLE VALVE CARBURETOR

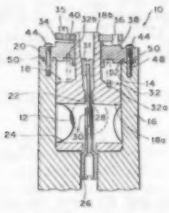
Hiroto Kobayashi, and Takeshi Kobayashi, both of Kawasaki, Japan, assignors to Walbro Far East, Inc., Kawasaki, Japan

Filed Dec. 6, 1982, Ser. No. 447,111
Claims priority, application Japan, Dec. 18, 1981, 56-187864[U]
Int. Cl.³ F02M *9/08*
U.S. Cl. 261—44 A 2 Claims

1. In a rotary throttle type carburetor in which a rotary throttle is positioned in a bore transverse to an air passage in a

carburetor body with a throttle passage registering with said air passage and a fuel nozzle extending into said throttle passage, and including a needle control valve mounted centrally of said rotary throttle and extending into said fuel nozzle,

that improvement in which a cover plate is positioned on said carburetor body to close said bore, said rotary throttle having a stem extending through said cover plate, an annular cam surface on the exposed surface of said cover



plate, a cam follower externally of said cover plate extending radially outward of said stem in axial contact with said cam surface, spring means between said cover plate and said throttle to maintain said cam follower in contact with said cam surface,

whereby rotating of said rotary throttle will cause an axial adjustment of said needle control valve relative to said fuel nozzle.

4,481,154

INSERT FOR PLACEMENT IN A VESSEL AND METHOD OF FORMING THE INSERT

Martin J. Gough, Birmingham, and John V. Rogers, Solihull, both of England, assignors to Cal Gavin Limited, Birmingham, England

Filed Mar. 17, 1982, Ser. No. 359,050

Claims priority, application United Kingdom, Mar. 20, 1981, 8108867

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—94 **15 Claims**

1. A method of making an insert for placement in a vessel to contact fluid therein comprising the steps of taking an insert comprising an elongate core having a plurality of loops disposed longitudinally therealong and angularly thereabout wherein a portion of each loop lies in close proximity to a first conceptual enveloping surface so that laterally rectilinear lines extending from the core to a mid point of the portion of a respective loop in close proximity to said first surface are disposed at different longitudinal positions along the core and at different angular orientations around the core, and acting on said loops to cause a portion thereof to lie in close proximity to a second conceptual enveloping surface of smaller cross-section than said first conceptual surface, prior to placement in said vessel, so that the portion in close proximity to said second conceptual surface is a greater proportion of the loop perimeter than that which was in close proximity to the first conceptual surface.

12. An insert for placement in a vessel to contact fluid therein comprising an elongate core having a plurality of loops of filamentary material disposed longitudinally therealong and angularly thereabout wherein a portion of each loop has been acted on to be moved from a first conceptual enveloping surface to a second conceptual enveloping surface of smaller cross section than said first conceptual surface, prior to placement in said vessel, so that laterally rectilinear lines extending from the core to a mid point of the portion of a respective loop in close proximity to said second conceptual surface are disposed at different longitudinal positions along the core and different angular orientations around the core, and wherein each line of each loop lies in a loop surface inclined to the longitudinal axis of the core at an acute angle when said line is longitudinally rectilinear or said line being longitudinally curved and said line of the loop and said axis of the core lying in a plane containing the core and extending radially therefrom.

4,481,155

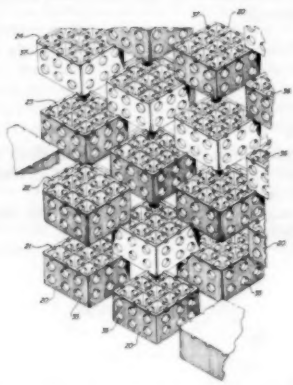
MULTI-CELL TILES WITH OPENINGS FOR USE IN A LIQUID COOLING TOWER

Paul A. Frohwerk, Granbury, Tex., assignor to Ceramic Cooling Tower Company, Fort Worth, Tex.

Filed Oct. 19, 1983, Ser. No. 543,413

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—94 **25 Claims**



1. A rectangular tile for the heat and mass transfer section of a liquid cooling tower comprising a first pair of generally parallel side walls having upper and lower edges and a second pair of generally parallel side walls having upper and lower edges which extend between the side walls of said first pair, at least one partition extending between the side walls of said first pair, and at least one partition extending between the side walls of said second pair and intersecting the first-mentioned partition whereby a plurality of cells are formed by the side walls and the partitions, each of said walls having at least one opening therethrough which lies between the upper and lower edges thereof and is surrounded by the side wall for each of the cells which are formed by that side wall whereby air and liquid can flow into and out of the cells through the openings in the side walls.

4,481,156

ATMOSPHERIC/LIQUID COOLER CONSTRUCTION

Jean Le Covec, Paris, France, assignor to Hamon-Sobelco, S.A., Brussels, Belgium

Filed Jun. 16, 1983, Ser. No. 504,732

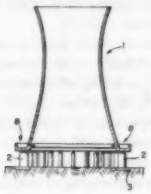
Claims priority, application France, Jul. 1, 1982, 82 11588

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—111 **6 Claims**

1. A cooler employing the air of the atmosphere and a streaming liquid of the type comprising a shell resting on piles

which are independent and evenly spaced apart on its periphery and, disposed inside said shell, a distribution system for a liquid to be cooled, liquid-gas contacting units extending under the distribution system and receiving devices for the liquid from the liquid-gas contacting means including channels, dis-



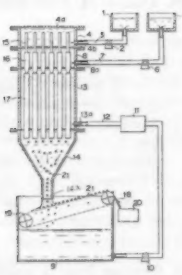
posed under the contacting unit, characterised in that the shell of the cooler rests on the piles through a wide peripheral lintel which has in its upper surface an inner flange and an outer flange defining a peripheral pan in which the cooled liquid collected in the channels is discharged by gravity.

4,481,157

METHOD AND APPARATUS FOR PRODUCTION OF MICROCAPSULES

Takashi Morishita, Nishinomiya; Hideki Sunohara, Osaka, and Shohachi Tanoue, Amagasaki, all of Japan, assignors to Morishita Jintan Co., Ltd., Osaka, Japan

Filed Apr. 27, 1982, Ser. No. 372,299
Int. Cl.³ B01J *13/02*; B28B *1/54*; B29F *3/08*
U.S. Cl. 264—4.1 **9 Claims**



1. A continuous method for producing microcapsules which comprises extruding a liquid material to be encapsulated from an orifice of an inner pipe and simultaneously extruding a liquid encapsulating material from an orifice of an outer pipe coaxially arranged around the inner pipe, and bleeding a coaxial jet flow of the material to be encapsulated as an inner flow and the encapsulating material as an outer flow into a flow of a coagulating agent for the encapsulating material in a capsule-forming cylinder arranged just beneath the orifice of the outer pipe, the coagulating agent being contained in a closed chamber and forced to flow in the capsule-forming cylinder.

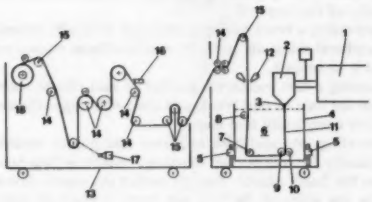
7. Apparatus for continuously producing microcapsules which comprises at least one inner pipe for extruding a material to be encapsulated, at least one outer pipe for extruding an encapsulating material, the outer pipe being coaxially arranged around the inner pipe, means for delivering the material to be encapsuled to the inner pipe, means for delivering the encapsulating material to the outer pipe, at least one capsule-forming cylinder through which a coaxial jet flow of the material to be encapsulated and encapsulating material flows downwardly and through which a coagulating agent is forced to flow downwardly, a closed chamber which contains the coagulating agent and in which the capsule-forming cylinder is arranged vertically and means for delivering the coagulating agent to the chamber.

4,481,158

EXTRUSION OF FILMS OF VINYLIDENE FLUORIDE POLYMERS

Pierre Georlette, Il - Oner Alyad, Israel, and Nestor Maquet, Waha, Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Nov. 16, 1982, Ser. No. 442,122
Claims priority, application France, Nov. 16, 1981, 81 21538
Int. Cl.³ B29D *7/24*
U.S. Cl. 264—22 **11 Claims**



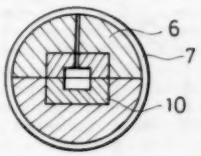
1. Process for the extrusion of films of vinylidene fluoride polymers having a predominantly crystalline structure of the beta type, comprising: subjecting an extruded film of molten polymer to a stretching of at least 200% in the direction of extrusion, and cooling the stretched film to a temperature below 50° C. when it has travelled a distance of at most 300 mm after leaving the die.

4,481,159

METHOD FOR RUBBER VULCANIZATION BY DIELECTRIC HEATING

Masaru Itoh, Komaki, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jan. 7, 1983, Ser. No. 456,430
Claims priority, application Japan, Jan. 20, 1982, 57-7355
Int. Cl.³ B29H *5/26*
U.S. Cl. 264—26 **4 Claims**



1. A method for vulcanizing rubber within a mold comprising the steps of:

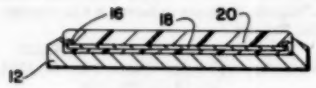
introducing a rubber material with a high dielectric loss factor into a cavity of a mold which is composed of an inner surface portion forming said cavity and being made of a dielectric material with a high dielectric loss factor, and an outer portion made of a dielectric material with a low dielectric loss factor and

heating said mold within a dielectric heating furnace, in a high frequency energy field whereby said rubber material is heated and cured, and said inner portion of the mold is heated and prevents the conduction of the heat of the rubber material toward said outer portion of the mold.

4,481,160
MANUFACTURE OF DECORATIVE EMBLEMS

Charles E. Bree, Delaware, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Filed Dec. 17, 1979, Ser. No. 103,963
Int. Cl.³ B29D 3/00
U.S. Cl. 264—135 **10 Claims**



1. A method for producing decorative emblems consisting essentially of the steps of:

(a) providing a bezel having a base and vertically extending peripheral sidewalls and into which a fluent plastic material is to be cast,

(b) casting a first measured amount of said plastic material onto the base of said bezel, said amount being sufficient to cover completely said base,

(c) inserting into said base and over said plastic material a generally flat, decorative foil shape, which is then pressed into the fluent plastic material so that the plastic flows up over the sides of the foil and forms a bead of material around the upper periphery thereof leaving at least a portion of the upper surface of said foil shape uncovered by said platic material,

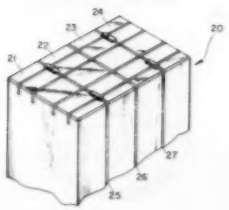
(d) casting a second measured amount of said plastic material onto said decorative foil shape thereby completely encpsulating said foil shape and permanently bonding it with said bezel and forming a cap contigous with the peripheral sidewalls of said bezel, and

(e) curing said plastic material so that it gives a lens effect to said decorated foil shape encapsulated within it.

4,481,161
PRESSURE STABILIZED INJECTION MOLD

Walter A. Grannen, III, Bargersville, Ind., assignor to E-W Mold & Tool Company, Inc., Indianapolis, Ind.

Filed Jan. 17, 1983, Ser. No. 458,289
Int. Cl.³ B29F 1/00
U.S. Cl. 264—328.8 **13 Claims**



1. A mold assembly for injection molding a container having parallel thin walled partitions comprising:

a base;

a plurality of cores cantileveredly mounted to said base, said cores spaced apart defining partition forming spaces and having free distal ends to form the bottom of said container;

a cavity assembly movably mounted to enclose said cores but spaced therefrom across a gap to form said container therein;

parallel wedges mounted on said cavity assembly and movable therewith to an engaging position whereat said wedges extend into some of said spaces between and against adjacent free distal ends of said cores limiting movement together of said cores so engaged;

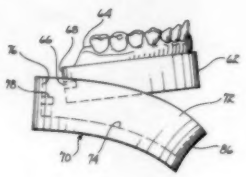
side locking means mounted with said cavity assembly for limited motion transverse to the direction of core extension and when in one position extending into sideways engagement with the outermost cores limiting outward movement thereof; and,

injection means mounted with said cavity assembly and aligned with those of said spaces not associated with said wedges and being spaced apart from said wedges a distance at least equal to from one of said spaces to another of said spaces and operable to inject plastic material into those spaces at a pressure sufficient to limit movement of said cores forming those spaces and cooperatively with said wedges limiting movement of said cores and by stabilizing said free distal ends forming said partition of uniform thickness.

4,481,162
FLEXIBLE MOLD FOR DENTAL MODEL BASES AND METHOD OF USING IT

Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 230,330, Feb. 2, 1981, Pat. No. 4,378,929. This application Apr. 11, 1983, Ser. No. 483,833
Int. Cl.³ B29C 1/02, 1/14, 7/00; B28B 7/06
U.S. Cl. 264—334 **10 Claims**



1. In a method for forming from a pourable hardenable compound deposited therein the base of a dental model useable with an articulator, the improvement comprising the steps of:

(a) defining the perimeter of a mold cavity and the opening to the mold cavity, which opening is essentially dimensionally coincident with the maximum dimensional planform of the mold cavity with a flexible sidewall and an upper edge of the sidewall, respectively;

(b) further defining the bottom of the mold cavity with a flexible substrate cooperating with cavity with a flexible substrate cooperating with the sidewall to define the bottom and lateral surfaces of the mold cavity;

(c) forming with a protrusion attached to a limited portion of the sidewall and extending within the perimeter of the mold cavity along a projection axis and partially across the mold cavity a receptacle within the base to which receptacle the articulator may be attached;

(d) removing the base formed from the mold cavity by bending the sidewall and substrate in concert to lower that part of the upper edge of the sidewall across the mold cavity from the location of the protrusion; and

(e) withdrawing the formed based from the mold cavity substantially along the projection axis of the protrusion to allow sliding disengagement of the protrusion from within the receptacle formed in the base.

4,481,163

METHOD OF MANUFACTURING A BOTTLE-SHAPED CONTAINER OF SYNTHETIC RESIN HAVING GROUND SURFACE

Akiho Ota, Funabashi, and Fumio Negishi, Tokyo, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 350,882, Feb. 22, 1982, , which is a division of Ser. No. 106,857, Dec. 26, 1979, abandoned. This application Oct. 28, 1983, Ser. No. 546,077

Claims priority, application Japan, Jan. 26, 1979, 54-9178; Jan. 26, 1979, 54-8446; Jan. 26, 1979, 54-8447

Int. Cl.³ B29C 17/07, 17/12; B29D 9/04

U.S. Cl. 264—513 4 Claims

1. A method of producing a bottle shaped container of synthetic resin having at least a partial outer layer portion with a rugged surface and thermally crystallized to have a whitened or blushed surfaced comprising the steps of:

injection molding a preformed piece of saturated polyester;

sandblasting the outer surface of said preformed piece until a rugged surface is formed thereon;

heating the outer layer portion of the preformed piece to thereby crystallize the outer layer portion to opacify it in white, the heating temperature being selected from the temperature range of from about 20° C. below the melting point of saturated polyester to the crystallization temperature of the polyester at the surface temperature of the preformed piece, the temperature and heating period being so selected as to crystalline the outer layer portion to substantially 1 mm in depth from the surface of the preformed piece, said piece having a mean density of the polymer within the range of from 1.345 to 1.375;

placing the crystallized preformed piece heated to orientation temperature, in the range from the glass transition temperature of the saturated polyester forming the preformed piece to the melting point thereof, into a blow mold;

biaxially orienting the crystallized preformed piece in the blow mold by blowing compressed air internally into the piece and simultaneously pushing down on a push rod in the piece thereby forming a bottle shaped container;

heat-setting the bottle shaped container wherein the outer peripheral wall surface of the piece makes contact with the inner surface of the mold, for at least 5 seconds;

cooling the bottle shaped container, immediately after the heat-setting step;

unloading the bottle shaped container from the mold;

matte coating the outer layer of the bottle shaped container with a mixture comprising colored pigment, low boiling point solvent, and powder silicon oxide to produce a colored opaque container with a rugged outer surface.

4,481,164

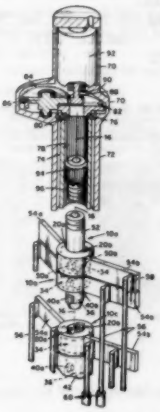
REACTIVITY CONTROL ASSEMBLY FOR NUCLEAR REACTOR

Lawrence R. Bollinger, Schenectady, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 17, 1982, Ser. No. 358,962

Int. Cl.³ G21C 7/08

U.S. Cl. 376—233 7 Claims



3. A reactivity control assembly for a nuclear reactor, comprising:

a plurality of interconnectible supports disposed in stacked relation above the core of said reactor and each comprising (1) a hub having an aperture extending between upper and lower ends thereof, said aperture including a first cylindrical bore at its upper end, a slot extending axially across the wall of said first bore, and a second cylindrical bore coaxially disposed below said first bore and having a diameter larger than the diameter of said first bore, (2) a retainer plate attached to and extending transversely of the lower end of said hub, said retainer plate having a cylindrical aperture extending between the upper and lower sides thereof, said aperture being coaxial with said first and second bores and having a diameter smaller than the diameter of said second bore, (3) a plurality of support arms attached to and radiating from said hub, and (4) a coupler including a cylindrical connector portion rotatably fitted in the aperture in said retainer plate and projecting downward therefrom, a connecting lug attached to and projecting radially outward from the lower end of said connector portion, and a cylindrical flange attached to and projecting radially outward from the upper end of said connector portion and rotatably held in said second bore of said hub, a cavity extending downwardly from the upper surface of said flange portion in coaxial relation with the aperture in said hub and a slot extending axially along the wall of said cavity;

a plurality of vertically disposed control rods connected in groups at their upper ends to respective ones of said support arms of said supports and extending downward therefrom for insertion into the core of said reactor when in a lowered position;

aligning means for holding said supports so that said apertures in said hubs thereof are centered on the same vertical axis and said slots in said first bores of said apertures are located at different angular positions about said axis;

a vertically disposed shaft positioned above said supports in coaxial relation with said apertures therein, a connecting lug being attached to and projecting radially from the lower end of said shaft: and

drive means for rotating said shaft about its longitudinal axis and moving it in opposite directions along said axis.

4,481,165

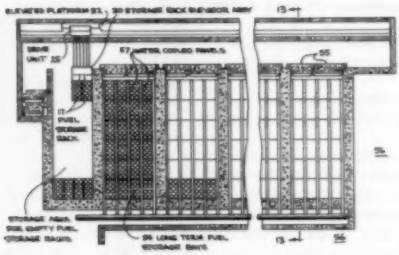
SYSTEM FOR HANDLING AND STORING RADIOACTIVE WASTE

John K. Anderson, San Diego, and Paul E. Lindemann, Escondido, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 19, 1982, Ser. No. 399,934

Int. Cl.³ G21C *19/32*

U.S. Cl. 376—272 **8 Claims**



1. A system for handling and storing solid radioactive waste, comprising:

at least one storage canister for containing solid radioactive waste;

at least one storage rack for holding said canister, said storage rack including floor incline compensating means;

at least one storage bay for storing said rack, said storage bay having an inclined surface;

means for providing access to said bay including an access tunnel and a control tunnel, said access and control tunnels being in open communication only along a lower portion of said tunnels; and

means for remote handling of said rack in said access tunnel for positioning said rack in said bay, said remote handling means including:

a drive unit located in said control tunnel,

a storage rack elevator assembly located in said access tunnel and operatively connected to said drive unit, said storage rack elevator assembly including air bearing means, and

portable shield means secured to said drive unit to minimize entry of radiation into said control tunnel from said access tunnel.

4,481,166

WEAR RESISTANT HARD METAL FREE OF TUNGSTEN CARBIDE

Helmut Holleck; Fritz Thuemmler, and Leo Prakash, all of Karlsruhe, Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 249,891

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3012631

Int. Cl.³ B22F *3/00*

U.S. Cl. 419—16 **15 Claims**

1. Wear-resistant hard metal free of tungsten carbide, comprising the components:

(a) molybdenum carbide;

(b) a carbide of another transition metal;

(c) boron, boron nitride, boron carbide, or a mixture thereof, in an amount of 0.01 to 1% by weight boron, based on the weight of components (a), (b) and (c);

(d) a binder metal selected from the group consisting of metals of the iron group of the Periodic Table of Elements, and alloys thereof; and

(e) wherein said molybdenum carbide and a carbide of another transition metal are present as mixed carbides of the formula $(M,Mo)C_{1-x}$, where M is at least one of the transition metals Ti, Zr, Hf, V, Nb, Ta and Cr, and x is less than or equal to 0.5, the amount of MoC_{1-x} being at least 40 mole % based on the moles of (a), (b) and (c) and wherein the binder metal comprises iron, cobalt, nickel, or an alloy thereof in an amount of between 5 and 40 weight %, based on the hard metal.

5. Method for producing a wear-resistant hard metal according to claim **1**, comprising the steps of:

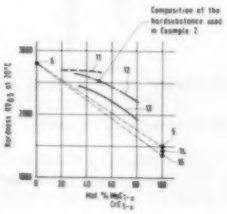
(i) mixing, in predetermined quantities, the components

(1) at least one powdered carbide of the transition metals Ti, Zr, Hf, V, Nb, Ta and Cr,

(2) Mo powder, Mo_2C powder, or a mixture thereof,

(3) carbon powder, and

(4) B powder, BN powder or B_4C powder, or a mixture thereof in an amount 0.01 to 1% by weight boron, based



on the weight of components (a), (b) and (c) with a powdered binder metal (d) to form a mixture; and

(ii) sintering the mixture under a protective gas atmosphere or a vacuum at a temperature between 1373° and 1873° K.

12. Method for producing a wear-resistant hard metal according to claim **1**, comprising the steps of:

(i) mixing the components

(1) at least one powdered carbide of the transition metals Ti, Zr, Hf, V, Nb, Ta and Cr,

(2) molybdenum carbide powder, and

(3) B powder, BN powder or B_4C powder, or a mixture thereof in an amount 0.01 to 1% by weight boron, based on the weight of components (a), (b) and (c) to form a powdered mixture;

(ii) sintering the powdered mixture at a temperature above 1773° K.;

(iii) grinding the sintered mixture;

(iv) mixing the ground, sintered mixture with a powdered binder metal; and

(v) sintering the mixture of ground sintered mixture with powdered binder metal.

4,481,167

SANITIZING COMPLEXES OF POLYOXAZOLINES OR POLYOXAZINES AND POLYHALIDE ANIONS

Sally P. Ginter, Sanford, and Percy J. Hamlin, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

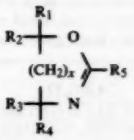
Continuation of Ser. No. 139,306, Apr. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 030,396, Apr. 16, 1979, abandoned. This application Jul. 1, 1981, Ser. No. 279,416

Int. Cl.³ A61K *31/74*; C08G *73/00*

U.S. Cl. 422—29 **21 Claims**

1. A water-soluble solid complex comprising:

(a) a polymer comprising a plurality of ring-opened units of a 2-oxazoline or 2-oxazine monomer corresponding to the formula



where R_1–R_4 are hydrogen or C_1–C_3 alkyl, R_5 is hydrogen or alkyl having up to about 18 carbon atoms, phenyl, or an inertly-substituted alkyl or phenyl, and x is 0 or 1;

(b) $IBrCl^-$ or a polyhalide anion of the formula $(XY_{2n})^-$ where X and Y are individually chloride, bromide or iodide, but not both chloride, and n is 1, 2 or 3; and

(c) a cation independently supplied from sources external to the polymer and selected from the group consisting of alkali metals, alkaline earth metals, hydrogen and mixtures thereof with the proviso that when the cation is hydrogen the ratio of halogen to halide in the complex is less than about 1:0.4.

4,481,168

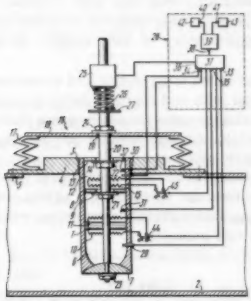
DEVICE FOR DETERMINING HEAT LOSSES DUE TO INCOMPLETE FUEL COMBUSTION

Boris A. Milovidov, Pavlodar, U.S.S.R., and Iosif B. Kaplunov, deceased, late of Moscow, U.S.S.R. (by Nadezhda V. Kaplunova, administrator), assignors to Pavlodarsky Industrialny Institut, U.S.S.R.

Filed Feb. 23, 1983, Ser. No. 468,982

Int. Cl.³ G01N *31/12, 25/22, 25/00*

U.S. Cl. 422—78 **2 Claims**



1. A device for determining heat losses due to incomplete combustion, comprising:

a first chamber for finish burning of a sample, said first chamber having an inlet and outlet;

a valve means installed at the inlet of said first chamber for the communication of a sample source with said first chamber;

a first electric heater arranged in said first chamber for finish burning of the sample;

a second chamber for finish burning of the sample, associated with said first chamber for finish burning of the sample;

a first separation valve installed in said first chamber for communication of said second chamber with said first chamber;

a second electric heater located in said second chamber for finish burning of the sample;

a porous partition disposed in said first chamber and intended for retention of any solid phase of said sample in said first chamber;

a means for suction and discharge of the sample, communicating with said second chamber for finish burning of the sample;

a second separation valve fitted in said second chamber for communication of said second chamber with said means for suction and discharge of the sample;

a means for measuring the thermal effect of the sample combustion reaction, comprising:

a first oxygen concentration sensor installed in said first chamber for finish burning of the sample;

a second oxygen concentration sensor installed in said second chamber for finish burning of the sample;

a first temperature sensor installed in said first chamber for finish burning of the sample;

a second temperature sensor installed in said second chamber for finish burning of the sample;

a control unit for controlling the input of said sample into said first and second chamber, receiving and transmitting signals from said oxygen and temperature sensors, and controlling said heaters, said control unit having a first input connected to said first oxygen concentration sensor, a second input connected to said second oxygen concentration sensor, a third input connected to said first temperature sensor, a fourth input connected to said second temperature sensor, and a first and a second outputs;

an oxygen loss indicating unit with an input thereof connected to said first output of said control unit, and a first and a second outputs;

an indicator of heat losses due to chemical underburning of fuel with an input thereof connected to said first output of said oxygen loss indicating unit;

an indicator of heat losses due to total chemical and mechanical underburning of fuel with an input thereof connected to said second output of said oxygen loss indicating unit;

a second output of said control unit associated with said valve means, said first separation valve, said second separation valve, said means for suction and discharge of the sample, said first electric heater, and with said second electric heater.

4,481,169

WASHING COLUMN

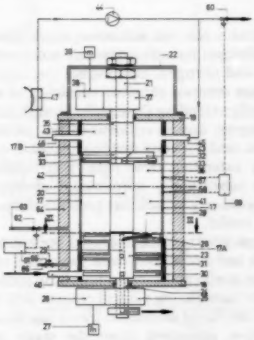
Bernardus G. M. van der Malen, Hagestein, Netherlands, assignor to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Dec. 27, 1982, Ser. No. 453,151

Claims priority, application Netherlands, Dec. 28, 1981, 8105872

Int. Cl.³ B01J *19/18*

U.S. Cl. 422—110 **19 Claims**



1. A washing column for the continuous separation between a solid chemical substance formed in a liquid multi-component system and the mother liquor in which this substance is suspended comprising:

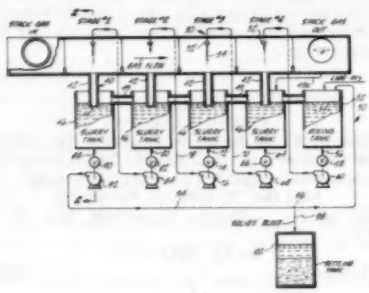
a cylindrical wall defining a working space;
means for supplying the suspension to said working space;
means in said working space for discharging mother liquor from the suspension with retention of the solid chemical substance;
means for forming in said working space a packed bed of said solid chemical substance under an absolute pressure exceeding 1 atmosphere;
means for continuously advancing said packed bed in said working space in the axial direction; and
means for forming a straight, plane washing front in said packed bed, perpendicular to the axis of the washing column between the mother liquor and a melt of said solid chemical substance, said washing front being practically stationary relative to the washing column, characterized in that the outer wall of said working space is of glass, said outer wall of the working space is surrounded by a second wall defining with the wall of said working space an enveloping space, a heat insulating medium is provided in said enveloping space, and means for attuning the pressure in said enveloping space to the pressure in said working space.

4,481,170

APPARATUS FOR TREATING STACK GASES

Alexander Wier, Jr., 8229 Billowvista Dr., Playa Del Rey, Calif. 90291

Continuation of Ser. No. 608,275, Aug. 27, 1975, abandoned, which is a continuation of Ser. No. 237,812, Mar. 24, 1972, Pat. No. 3,948,608. This application May 29, 1979, Ser. No. 42,915
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.[3] **B01D** *53/34*; **B01J** *10/00, 19/26*
U.S. Cl. 422—168 **12 Claims**



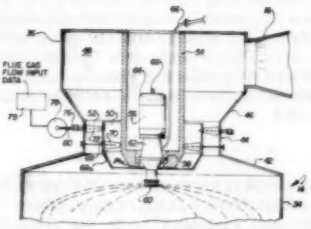
1. An apparatus for wet scrubbing stack gases to remove therefrom pollutants including gaseous pollutants such as oxides of sulfur and nitrogen, comprising:
(a) a pollutant removal chamber consisting of a substantially horizontally extending flow path through which the stack gases progress during removal of the gaseous pollutants therefrom, said pollutant removal chamber not including a vertically extending flow path, said defined flow path having a substantially unrestricted cross-sectional flow area to avoid any substantial pressure drop between said inlet and outlet;
(b) a stack gas inlet at one end of said horizontally extending flow path and a scrubbed stack gas outlet at the opposite end of the horizontally extending flow path, and
(c) means for introducing a liquid reagent into said flow path to cause said liquid reagent to travel across said flow path and remove pollutants from the stack gases flowing through said chamber without any substantial entrainment of any pollutant laden liquid reagent within the stack gases, and wherein said liquid reagent introducing means includes spraying means for spraying said liquid reagent into said chamber to substantially cover, at least one stage therein, the cross-sectional flow area of said flow path with spray droplets of said liquid reagent which absorb pollutants within the stack gases passing therethrough.

4,481,171

REACTOR FOR DRY FLUE GAS DESULFURIZATION

Stanley J. Baran, Cherry Hill, N.J.; John Van Camp, Philadelphia, and Kurudamannil A. George, Levittown, both of Pa., assignors to Proctor & Schwartz, Inc., Philadelphia, Pa.

Filed Jun. 30, 1981, Ser. No. 279,087
Int. Cl.[3] **B01D** *47/00*; **F01C** *1/00*
U.S. Cl. 422—176 **6 Claims**



1. A spray reactor assembly particularly suitable for flue gas desulfurization adjustable to compensate for substantial turndown of flue gas flow, comprising
a reactor vessel;
an atomizing rotating spray disc axially positioned within said reactor vessel;
means communicating said disc with a source of alkaline reagent, said disc being adapted to inject an atomized, umbrella-shaped spray of said reagent in said reactor vessel;
gas inlet means in the form of first and second annular duct means coaxial with said disc and defining inner and outer annular coaxial passages terminating in a plane above said disc adapted to impinge annular gas streams onto said umbrella spray; and
damper means adapted to reduce the flow in the outer of said passages, in response to turndown of the flue gas flow, sufficient to maintain a relatively constant velocity flow in the inner of said passages.

4,481,172

PROCESS FOR REMOVAL OF SULFUR OXIDES FROM WASTE GASES

Philip S. Lowell, and James L. Phillips, both of Austin, Tex., assignors to Environmental Elements Corp., Baltimore, Md.

Continuation-in-part of Ser. No. 303,359, Sep. 18, 1981, abandoned. This application Apr. 6, 1983, Ser. No. 482,629
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.[3] **C01B** *17/00*; **B01J** *8/00*; **C01D** *8/00*
U.S. Cl. 423—242 **8 Claims**

1. A method for the removal of sulfur oxide from industrial waste gas containing same comprising:
(a) contacting said gas with a solid activated sodium carbonate sorbent in an amount sufficient to react with substantially all of the sulfur oxide present in said gas to form solids of unreacted sorbent, sodium sulfite, sulfate, and mixtures thereof, and a waste gas substantially free of sulfur oxide;
(b) venting the resultant waste gas from the process, dissolving said solids in an alkaline ammonia liquor defining an alkaline carrier to form soluble sodium compounds;
(c) carbonating the resultant alkaline sodium liquor from

step (b) and cooling to a temperature sufficient to form sodium bicarbonate or trona crystals;

(d) separating the sodium bicarbonate or trona crystals from the liquor of step (c) and heating said bicarbonate and/or trona crystals for a time and at a temperature sufficient to form activated sodium carbonate, and recycling said activated sodium carbonate to step (a); and

(e) removing carbon dioxide from the cooled liquor of step (c) by inserting said cooled liquor in a carbon dioxide stripper and contacting said cooled liquor with a stripping gas, adding a precipitant selected from the class consisting of alkaline earth metal hydroxides, oxides and mixtures thereof to the resultant liquor to render it alkaline and form insoluble solids comprising alkaline earth metal sulfates, sulfites and mixtures thereof, separating said solids and recycling the resultant alkaline liquor to step (b).

4,481,173

MANUFACTURE OF LOW SODIUM ZEOLITE

Pochen Chu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,497

Int. Cl.[3] C01B *33/28*

U.S. Cl. 423—277 **15 Claims**

1. In a method for the preparation of zeolite ZSM-11 by crystallization of the zeolite from a composition containing sources of alkali metal oxide, silicon oxide and a quaternary alkyl ammonium compound having alkyl groups of 2 to 7 carbon atoms, the improvement which comprises adding to the composition a source of benzyltrimethyl ammonium cations.

6. Zeolite ZSM-11 in the as-synthesized form having a combined content of alkali and alkaline earth metal of not more than 0.2 weight percent and containing as organic cations both quaternary alkyl ammonium compound having an alkyl group having 2 to 7 carbon atoms and benzyltrimethyl ammonium and wherein the molar ratio of benzyltrimethyl ammonium to the total organic cation present is 0.01 to 0.99.

4,481,174

CRYSTALLINE ALUMINOSILICATE AND PROCESS FOR ITS PRODUCTION

Michael Baacke, and Peter Kleinschmit, both of Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 477,874

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211433

Int. Cl.[3] C01G *39/00*; C01B *33/26*

U.S. Cl. 423—306 **14 Claims**

1. A process for the production of crystalline aluminosilicate PZ 1 having analytical composition:

3.0 ± 1.0%	Na_2O
1.5 ± 1.0%	Al_2O_3
85.0 ± 5.0%	SiO_2
0.5 ± 0.3%	P_2O_5
5.0 ± 3.0%	Loss on Calcining

and an X-ray diffraction pattern having the following lines:

d [Å]	I/Io
15.49	100
9.97	7
9.18	1
7.31	2
5.15	17
4.84	13
4.55	7
4.23	5
3.68	6
3.56	14
3.44	59
3.30	30
3.15	28
2.15	18
1.88	3
1.83	6

comprising crystallizing said aluminosilicate from an aqueous SiO_2, Al_2O_3 and an alkali containing synthesis mixture having a composition as follows:

SiO_2/Al_2O_3	=	20–250
Na_2O/SiO_2	=	0.01–0.5
OH/SiO_2	=	0.01–1.0
T/SiO_2	=	0.01–0.2
H_2O/SiO_2	=	10–40

wherein T is an organic template compound of the formula $R_3P—(CH_2)_n—PR_3X_2$ wherein R is a lower alkyl group, n is an integer from 2 to 6 and X is Br^- or I^-.

7. A crystalline aluminosilicate selected from the group consisting of (1) aluminosilicate PZ1 having analytical composition:

3.0 ± 1.0%	Na_2O
1.5 ± 1.0%	Al_2O_3
88.0 ± 5.0%	SiO_2
0.5 ± 0.3%	P_2O_5
5.0 ± 3.0%	Loss on Calcining

and an X-ray diffraction pattern having the following lines:

d [Å]	I/Io
15.49	100
9.97	7
9.18	1
7.31	2
5.15	17
4.84	13
4.55	7
4.23	5
3.68	6
3.56	14
3.44	59
3.30	30
3.15	28
2.15	18
1.88	3
1.83	6

and (2) aluminosilicate PZ2

0.05 ± 0.03%	Na_2O
1.40 ± 0.6%	Al_2O_3
88.0 ± 3.0%	SiO_2
0.5 ± 0.2%	P_2O_5
3.0 ± 1.0%	Loss on Ignition

and an X-ray diffraction pattern having the following lines

d[Å]	I/Io
13.48	100
7.34	24
3.55	55
3.40	85
1.85	20.

4,481,175
PROCESS FOR PREPARING APATITE
Shinji Iino; Akihiko Nakamura; Kensaku Maruyama, and Kohji Nakamura, all of Shimonoseki, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Oct. 21, 1983, Ser. No. 544,361
Claims priority, application Japan, Dec. 14, 1982, 57-217842; May 23, 1983, 58-89288
Int. Cl.³ C01B 25/32
U.S. Cl. 423—308 15 Claims

1. In the process for preparing a calcium-phosphorus apatite by reacting at least one calcium compound with at least one phosphorus compound, the improvement characterized in that the calcium-phosphorus atomic ratio of said calcium compound and said phosphorus compound is from about 1.30 to about 1.90, and said reaction is carried out in a reaction medium which contains at least one organic solvent said reaction being conducted for a sufficient length of time so as to form said apatite.

4,481,176
TREATMENT FOR PHOSPHORUS-CONTAINING WASTE MATERIAL
David L. Dodson, Columbia; Bruce D. Pate, Winchester, and Philip C. Rogers, Columbia, all of Tenn., assignors to Stauffer Chemical Company, Westport, Conn.
Filed Oct. 3, 1983, Ser. No. 538,696
Int. Cl.³ C01B 25/01, 25/02, 25/04
U.S. Cl. 423—322 8 Claims

1. A process of recovering elemental phosphorus values from phosphorus-containing waste material comprising the steps of:

(a) sizing the solids content of phosphorus-containing waste material to provide a suitable particle size for filtration as well as a homogenized feed in the resulting filter feed stream to obtain a consistent filter feed;

(b) passing the phosphorus-containing waste material from step (a) through a continuous thin-cake filter where the phosphorus values are filtered through unfilterable material to produce a filtrate high in elemental phosphorus values; and

(c) recovering the elemental phosphorus values from the filtrate.

4,481,177
SYNTHESIS OF ZEOLITE ZSM-22 WITH A HETEROCYCLIC ORGANIC COMPOUND
Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Dec. 9, 1982, Ser. No. 448,133
Int. Cl.³ C01B 33/28
U.S. Cl. 423—329 18 Claims

1. A process for preparing a siliceous porous crystalline ZSM-22 zeolite material having the x-ray diffraction pattern of Table I, which comprises preparing a reaction mixture capable of forming said ZSM-22 zeolite material, said reaction mixture comprising sufficient sources of an alkali or alkaline earth metal, alumina, silica, RN and water, said sources having a composition, in terms of mole ratios, encompassed within the following ratios;

SiO_2/Al_2O_3=20 to ∞
H_2O/SiO_2=10 to 100
OH^-/SiO_2=0 to 1.0
M^+/SiO_2=0 to 2.0
RN/SiO_2=0.01 to 2.0

wherein RN is an N-ethylpyridinium cation and M is an alkali or alkaline earth metal, and maintaining the mixture at sufficient crystallization conditions until crystals of said zeolite are formed.

4,481,178
PURIFICATION OF CHLOROSILANES
William D. Kray, Burnt Hills, N.Y., assignor to General Electric Company, Waterford, N.Y.
Filed Nov. 8, 1982, Ser. No. 439,784
Int. Cl.³ C01B 33/08
U.S. Cl. 423—342 10 Claims

1. A method for purifying chlorosilanes selected from the group consisting of silicon tetrachloride, trichlorosilane, dichlorosilane, and mixtures thereof comprising:

(A) adding to a solution of chlorosilane contaminated with Lewis base impurities a 2-fold to 50-fold molar excess, based on the concentration of impurities, of a transition metal compound;

(B) heating the solution at temperatures below about 150° C. until formation of thermally stable complexes between said impurities and said transition metal compound occurs, under sufficient pressures to prevent distillation of the chlorosilane; and

(C) removing purified chlorosilane from the solution by distillation at temperatures below about 200° C. and at pressures such that the distillation conditions do not cause decomposition of said stable complexes.

4,481,179
METHOD FOR FORMING FIBROUS SILICON CARBIDE INSULATING MATERIAL
George C. Wei, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Oct. 12, 1983, Ser. No. 541,196
Int. Cl.³ C04B 35/56
U.S. Cl. 423—346 3 Claims

1. A method of forming a thermal insulating material consisting essentially of SiC fibers, consisting essentially of:

forming a precursor material wherein carbon fibers are bonded together by a carbon binder; and

contacting gaseous SiO with said precursor material to thereby convert the carbon fibers and carbon binder therein to SiC.

4,481,180
DIAMOND SYNTHESIS PROCESS
Serge Bedére, Chalo sur Mars; Jean-Phillippe Borgoltz, Saint Germain les Arpajon, and Claude Moussin, Velizy Villacoublay, all of France, assignors to Commissariat A l'Energie Atomique, Paris, France
Continuation of Ser. No. 265,248, May 19, 1981, abandoned.
This application Feb. 9, 1983, Ser. No. 464,784
Claims priority, application France, May 29, 1980, 80 11942
Int. Cl.³ C01B 31/06
U.S. Cl. 423—446 7 Claims

1. A process for the synthesis of diamond, comprising:

placing in a high pressure enclosure a stack of graphite pellets and a catalyst material, wherein said catalyst material is a eutectic alloy of at least one metal of group VII or VIII of the periodic system with an element having the same crystallographic structure as the diamond selected from the group consisting of germanium and silicon;

increasing the pressure in the enclosure to a pressure ranging from 30 to 60 kilobars and then the temperature to within the range of 800° C. to 1200° C. until the alloy starts to liquefy, at least part of the said element being in the form of solid particles within the liquid mass;

maintaining the temperature and pressure conditions for a sufficient time for the graphite to be changed into diamond, the carbon migrating through the liquefied alloy from the pellets to the aforementioned solid particles on which it is deposited and crystallized by epitaxy in the diamond system; and

then returning to the initial conditions.

4,481,181

HYDROGEN PRODUCTION FROM IN SITU PARTIAL BURNING OF H_2S

John H. Norman, La Jolla, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 345,034, Feb. 8, 1982, abandoned. This application Sep. 29, 1983, Ser. No. 537,299

Int. Cl.[3] **C01B** *17/04*

U.S. Cl. 423—573 G **11 Claims**

1. A process for producing hydrogen from hydrogen sulfide consisting essentially of

heating an incoming stream consisting essentially of hydrogen sulfide to at least about 1100° K.,

introducing said heated hydrogen sulfide stream and oxygen into a reaction zone in a volume ratio of between about 10:1 and about 25:1 and controlling said introduction to maintain the temperature in said reaction zone between about 1300° K. and 1600° K. under conditions which effect thermal dissociation of hydrogen sulfide and partial combustion of hydrogen sulfide to water and sulfur without the addition of heat from other sources and with the amount of hydrogen sulfide that undergoes partial combustion being not greater than the amount which undergoes thermal dissociation into hydrogen and sulfur within said reaction zone,

withdrawing gas containing said dissociated hydrogen and sulfur from said reaction zone and promptly mixing said withdrawn gas with a cooler gas stream to quench the high temperature thereof to about 1200° K. or below and prevent substantial recombination of hydrogen and sulfur within said withdrawn gas,

employing heat from said total quenched gas stream to heat said incoming stream of hydrogen sulfide to a temperature of at least about 1100° K. prior to its introduction into said reaction zone and separating a side stream therefrom which is used as said cooler gas stream, and

recovering hydrogen from said withdrawn gas subsequent to said quenching step.

4,481,182

SYNTHESIS OF COMPLEX BERYLLIUM HYDRIDES

Roy J. Laran, Greenwell Springs, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 28, 1983, Ser. No. 566,192

Int. Cl.[3] **C01B** *6/24*

U.S. Cl. 423—644 **27 Claims**

1. A process which comprises subjecting a mixture of beryllium and an alkali metal beryllium complex of the formula

$$MBeR_mH_n$$

wherein M is an alkali metal, R is a hydrocarbyl group, m is an integer from 1 to 3, n is an integer from 0 to 2, the total of m and n being 3, to a pressurized atmosphere of hydrogen and an elevated temperature at which alkali metal beryllium tetrahydride of the formula M_2BeH_4 is produced.

4,481,183

SYNTHESIS OF COMPLEX BERYLLIUM HYDRIDES

Roy J. Laran, Greenwell Springs, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 28, 1983, Ser. No. 566,193

Int. Cl.[3] **C01B** *6/24*

U.S. Cl. 423—644 **27 Claims**

1. A process which comprises subjecting a mixture of beryllium and an alkali metal aluminum complex of the formula

$$MAlR_mH_n$$

wherein M is an alkali metal, R is a hydrocarbyl group, m is an integer from 1 to 4, n is an integer from 0 to 3, the total of m and n being 4, to a pressurized atmosphere of hydrogen and an elevated temperature at which alkali metal beryllium tetrahydride of the formula M_2BeH_4 is produced.

4,481,184

CATIONIC TECHNETIUM (I) COMPLEXES

James F. Kronauge, Plainsboro, N.J., and Kenneth A. Glavan, Toledo, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 14, 1983, Ser. No. 465,957

Int. Cl.[3] **A61K** *29/00, 49/00*

U.S. Cl. 424—1.1 **17 Claims**

1. A complex having the formula

$$[^{99m}Tc(L)_n]^{\oplus}A^{\ominus}$$

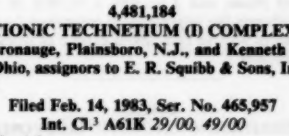
wherein

A is an anion;

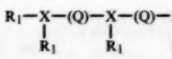
n is 1, 2, 3 or 6;

if n is 1, L is a hexadentate ligand having the formula

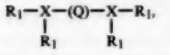
or



if n is 2, L is a tridentate ligand having the formula

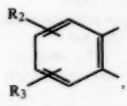


if n is 3, L is a bidentate ligand having the formula



and if n is 6, L is a monodentate ligand having the formula

wherein X is phosphorus or arsenic, the R_1 groups are the same or different alkyl or aryl groups, each Q is independently a $-(CH_2)_m-$ group or



m is 1, 2 or 3 and R_2 and R_3 are the same or different and each is hydrogen, alkyl, or halogen.

4,481,185

STABLE EMULSIONS OBTAINED FROM A NATURAL EMULSIFIER STABILIZED WITH ALOES JUICE

Jean-Francois Grollier, Paris, and Francoise Boudy, Levallois-Perret, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Jul. 15, 1981, Ser. No. 283,448

Claims priority, application France, Jul. 25, 1980, 80 16469

Int. Cl.³ A61K *7/42, 7/44;* **B01J** *13/00*

U.S. Cl. 424—59 **11 Claims**

1. In an oil-in-water cosmetic emulsion comprising a water phase, an oil phase, and 3 to 30% a lecithin or saponoside emulsifier, wherein the improvement comprises the addition of 0.3 to 30% aloes juice or an aqueous extract of aloes juice as an emulsion stabilizer.

4,481,186

NON-IRRITATING COSMETIC COMPOSITION CONTAINING GLUCAMINE FATTY ACID EMULSIFIER SOAP

George E. Deckner, Westfield, N.J., assignor to Charles of the Ritz Group Ltd., New York, N.Y.

Filed May 27, 1983, Ser. No. 499,057

Int. Cl.³ A61K *7/15, 7/42, 7/44, 31/16*

U.S. Cl. 424—59 **12 Claims**

1. A non-irritating cosmetic or soothing "Moisturizing and conditioning" skin composition consisting essentially of a non-irritating glucamine-fatty acid emulsifier soap formed of from about 0.1 to about 5% by weight glucamine and from about 1 to about 10% by weight of a fatty acid containing 10 to 30 carbons, 40 to 90% water, "At least one thickener, at least one humectant" and at least one preservative.

4,481,187

CLEAR LIQUID SKIN COSMETIC COMPOSITIONS

Mitsuo Kondo; Hiromi Minamino; Yasuhisa Otani, all of Odawara; Akira Miyashita, Yokohama; Kenzo Okada, Tokyo, and Takashi Kuramoto, Onomichi, all of Japan, assignors to Kanebo, Ltd. and Maruzen Kasei Co., Ltd., both of, Japan

Continuation-in-part of Ser. No. 241,524, Mar. 9, 1981, abandoned. This application Feb. 1, 1983, Ser. No. 462,720

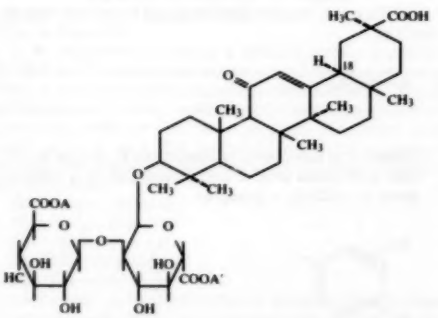
Claims priority, application Japan, Mar. 8, 1980, 55-29608; Oct. 2, 1980, 55-138512

Int. Cl.³ A61K *7/021, 7/15, 7/46, 7/48*

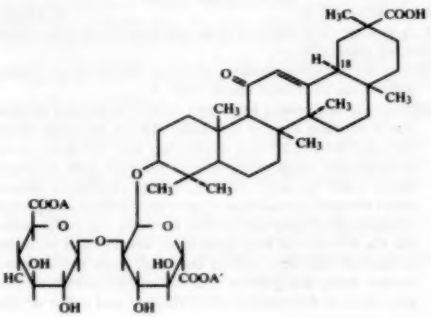
U.S. Cl. 424—63 **10 Claims**

1. A clear, liquid skin cleansing and conditioning cosmetic composition which consists essentially of

(a) a solubilizing agent selected from the group consisting of from 0.01 to 10% by weight based on the total weight of the skin cosmetic composition of at least one 18α-glycyrrhizin of the structural formula:



in which A and A′ independently represent sodium atoms, potassium atoms or ammonium groups, and from 0.01 to 10% by weight based on the total weight of the skin cosmetic composition of a glycyrrhizin composition consisting essentially of from 30 to 98 mole % of said 18α-glycyrrhizin and from 2 to 70 mole % of an 18β-glycyrrhizin of the structural formula:



in which A and A′ independently represent sodium atoms, potassium atoms or ammonium groups;

(b) an oily substance selected from the group consisting of oil soluble natural and synthetic perfumes, in an amount of from 0.0001 to 1.0% by weight based on the total weight of the skin cosmetic composition; and

(c) water in an amount of from 50 to 99% by weight based on the total weight of the skin cosmetic composition;

said skin cosmetic composition having a pH value in the range of from 4.2 to 6.4.

4,481,188

VACCINES

Peter Apontoweil, Leersum, and Manfred M. Krasselt, De Bilt, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Aug. 20, 1982, Ser. No. 409,996

Claims priority, application European Pat. Off., Aug. 28, 1981, 81200960.3

Int. Cl.³ A61K *39/215*

U.S. Cl. 424—89 **5 Claims**

1. A combined infectious bronchitis water-in-oil emulsion oil-adjuvant vaccine having a volume ratio between the aqueous phase and the oily phase from 3:7 to 1:1 of at least 104.0EID.50 per dose of each of the virus components of inactivated vaccine derived from at least one virus strain selected from the group consisting of infectious bronchitis virus strain identified by the internal notation Gelderland. 901 deposited at the Czechoslovak National Collection of Type Cultures of the Institute of Hygiene and Epideminology in Prague under No. CNCTC AO 17/81 and deposited at the Collection Nationale de Cultures de Micro organismes d'Institute Pasteur, Paris, under No. I-168 and infectious bronchitis virus strain by the internal notation Brabant. 802, deposited at the Czechoslovak National Collection of Type Cultures of the Institute of Hygiene and Epidemiology in Prague under No. CNCTC 18/82 and deposited at the Collection Nationale d'Institute Pasteur, Paris, under No. I-202 combined with a second vaccine derived from the IBV H120 or the IBV H52 of the Massachusetts type.

4,481,189

PROCESS FOR PREPARING STERILIZED PLASMA AND PLASMA DERIVATIVES

Alfred M. Prince, Pound Ridge, N.Y., assignor to New York Blood Center Inc., New York, N.Y.

Filed Apr. 14, 1982, Ser. No. 368,250
Int. Cl.³ A61K *35/16*
U.S. Cl. 424—101 **13 Claims**

1. A process for inactivating the hepatitis B virus in mammalian blood plasma or a concentrate therefrom which comprises contacting said blood plasma or a concentrate therefrom with ether for a time sufficient to inactivate said virus.

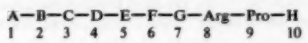
4,481,190

NONAPEPTIDE AND DECAPEPTIDE ANALOGS OF LHRH USEFUL AS LHRH ANTAGONISTS

John J. Nestor, San Jose, and Brian H. Vickery, Cupertino, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 21, 1982, Ser. No. 451,671
Int. Cl.³ C07C *103/52*; A61K *37/02*
U.S. Cl. 424—177 **17 Claims**

1. A compound of the formula



(I)

and the pharmaceutically acceptable salts thereof, wherein:

A is an amino acyl residue selected from the group consisting of N-Ac-D,L-$\Delta^{3,4}$-prolyl, N-Ac-D,L-prolyl, N-Ac-L-alkylprolyl, N-Ac-D,L-phenylalanyl, N-Ac-D,L-p-chlorophenylalanyl, N-Ac-D,L-seryl, N-Ac-D,L-threonyl, N-Ac-D,L-alanyl, 3-(1-naphthyl)-D,L-alanyl, 3-(2-naphthyl)-D,L-alanyl, 3-(2,4,6-trimethylphenyl)-D,L-alanyl, and 3-(4-trifluoromethylphenyl)-D,L-alanyl;

B is an amino acyl residue selected from the group consisting of D-phenylalanyl, D-p-Cl-phenylalanyl, D-p-F-phenylalanyl, D-p-nitrophenylalanyl, 3-(3,4,5-trimethoxyphenyl)-D-alanyl, 2,2-diphenylglycyl, D-α-methyl-p-Cl-phenylalanyl and 3-(2,4,6-trimethylphenyl)-D-alanyl;

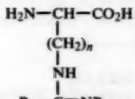
C is an amino acyl residue selected from the group consisting of D-tryptophanyl, D-phenylalanyl, D-Me₅phenylalanyl, 3-(3-pyridyl)-D-alanyl, 3-(1-naphthyl)-D-alanyl, and 3-(2-naphthyl)-D-alanyl;

D is an amino acyl residue selected from the group consisting of L-seryl, and D-alanyl;

E is an amimo acyl residue selected from the group consisting of L-phenylalanyl and L-tyrosyl;

F is an amino acyl residue selected from the group consisting of the radicals represented by the following structural formulas:

(a)



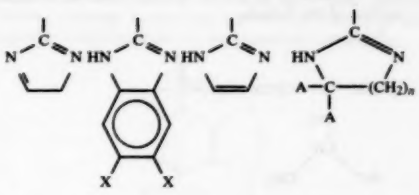
(II)

wherein

n is 1 to 5;

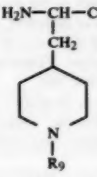
R_1 is alkyl of 1 to 12 carbon atoms, —NHR_3 wherein R_3 is alkyl of 1 to 12 carbon atoms, cycloalkyl, phenyl, benzyl, morpholino or —$(CH_2)_nN(R_4)_2$ wherein n is 1 to 5 and R_4 is lower alkyl;

R_2 is R_1; or R_1 and R_2 comprise a ring represented by the following structural formulas:

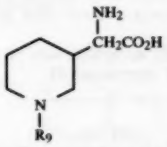


wherein n is 1 to 7; A is hydrogen, alkyl of 1 to 6 carbon atoms or cycloalkyl; and X is halo or A or

(b) a substituent of the formula



(IV)



(V)

wherein R_9 is hydrogen, alkyl of 1 to 12 carbon atoms, phenyl or phenylloweralkyl;

G is an amino acyl residue selected from the group consisting of L-leucyl, L-norleucyl and L-norvalyl;

H is D-alaninamide, D-leucinamide, glycinamide or —NHR_5 wherein R_5 is lower alkyl or $NHCONH_2$.

4,481,191

METHOD FOR CONTROLLING BLOOD PRESSURE

Edward T. Wei, El Cerrito; Nancy M. Lee, San Francisco, and Jaw-Kang Chang, San Carlos, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 30, 1983, Ser. No. 480,691
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **7 Claims**

1. A method for treating high blood pressure or disturbances of cardiac function comprising:

administering a therapeutically effective amount of dynorphin(1-13) or dynorphin(1-10).

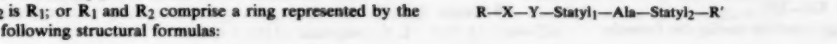
4,481,192

ACID-PROTEASE INHIBITING PEPTIDE DERIVATIVES

Catherine Cazaubon, Montpellier; Joseph Diaz, Perols; Rémy Guegan, Castelnau-le-Lez; Bernard Castro, Mauguio; Geneviève Evin; Pierre Corvol, both of Paris, and Jean-Pierre Gagnol, St-Martin-de-Londres, all of France, assignors to SANOFI and Institut Nationale de la Sante et de la Recherche Medicale, both of Paris, France

Filed Aug. 12, 1983, Ser. No. 522,534
Claims priority, application France, Aug. 17, 1982, 82 14219
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **6 Claims**

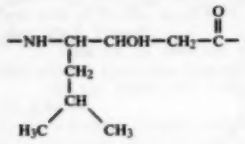
1. Peptide derivatives of the general formula:



R—X—Y—Statyl₁—Ala—Statyl₂—R' (I),

in which:

Statyl$_1$ represents the radical derived from the aminoacid statine, of the formula



3S,4S isomer and Statyl$_2$ denotes the statyl radical derived from the same aminoacid, but can be the 3S,4S isomer or the 3R,4S isomer,

R denotes a hydrogen atom or an acylating group attached to the terminal amino group of the aminoacid X—,

X and Y, which are identical or different, denote aminoacids chosen from the following aminoacids:

X: Phenylalanine, Tryptophan, Histidine, Boc-Histidine, Tyrosine, Proline, Isoleucine, and

Y: Phenylalanine, Tryptophan, Histidine, Tyrosine, Proline, Leucine, Isoleucine, Norleucine, Valine, Norvaline, Alanine, Glycine, Lysine, Z-lysine and α-Aminobutyric acid, and

R′ represents OH, O-lower alkyl, NH_2 or a group NH—R_1, in which R_1 represent a lower alkyl or lower aralkyl group,

and the pharmaceutically acceptable salts of the products of the formula (1) when R′ represents OH.

4,481,193

DES-PROLINE VASOPRESSIN ANTAGONISTS

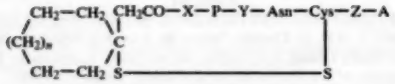
Fadia E. Ali, Cherry Hill, N.J., and William F. Huffman, Malvern, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Mar. 7, 1984, Ser. No. 586,933

Int. Cl.^{3} A61K *37/00*; **C07C** *103/52*

U.S. Cl. 424—177 **15 Claims**

1. A polypeptide having the formula:



in which:

P is Phe or Phe(4′-Alk);

X is D-Phe, D-Val, D-Nva, D-Leu, D-Ile, D-Pba, D-Nle, D-Cha, D-Abu, D-Met, D-Chg, D or L-Tyr or D or L-Tyr(Alk);

Y is Val, Ile, Abu, Ala, Chg, Gln, Lys, Cha, Nle, Phe, Leu or Gly;

Z is D or L-Arg or D or L-Lys;

A is Gly(NH_2), Gly or Gly(NHAlk); and

n is 0–2, or pharmaceutically acceptable salts, esters or complexes thereof.

4,481,194

DES-PROLINE-DES-GLYCINE VASOPRESSIN ANTAGONISTS

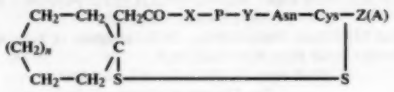
Fadia E. Ali, Cherry Hill, N.J., and William F. Huffman, Malvern, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Mar. 7, 1984, Ser. No. 586,934

Int. Cl.^{3} A61K *37/00*; **C07C** *103/52*

U.S. Cl. 424—177 **16 Claims**

1. A polypeptide having the formula:



in which:

P is Phe or Phe(4′-Alk);

X is D-Phe, D-Val, D-Nva, D-Leu, D-Ile, D-Pba, D-Nle, D-Cha, D-Abu, D-Met, D-Chg, D or L-Tyr or D or L-Tyr(alk);

Y is Val, Ile, Abu, Ala, Chg, Gln, Lys, Cha, Nle, Phe, Leu or Gly;

Z is D-Arg, L-Arg, D-Lys or L-Lys;

A is OH, NH_2 or NHAlK; and

n is 0–2, or a pharmaceutically acceptable salt, prodrug ester or complex thereof.

4,481,195

METHOD FOR THE TREATMENT OF TUMORS WITH β-GLUCURONIDASE ACTIVITY DEPENDENT PHARMACEUTICALS

David Rubin, c/o Israel Medical Research Foundation, P.O. Box 3592, Jerusalem, Israel, assignor to Adolf Schwimmer, Savyon; Irwin S. Schwartz, Tel-Aviv; David Rubin, Jerusalem, all of, Israel and Century Science Corp., Port Washington, N.Y.

Continuation-in-part of Ser. No. 951,269, Oct. 13, 1978, and a continuation-in-part of Ser. No. 951,270, Oct. 13, 1978, Pat. No. 4,424,348, and a continuation-in-part of Ser. No. 11,619, Feb. 12, 1979, Pat. No. 3,630,146, and a continuation-in-part of Ser. No. 89,888, Oct. 31, 1979, Pat. No. 4,337,760. This application Oct. 13, 1981, Ser. No. 311,031

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.^{3} A61B *19/00*; **A61K** *31/70*

U.S. Cl. 424—180 **13 Claims**

1. In a process of selectively delivering the aglycone of a glucuronide compound to tumor cells having higher β-glucuronidase activity than that of the surrounding tissues by hyperacidifying the tumor cells and then administering to the patient a glucuronide compound, the aglycone of which is to be delivered to the tumor cells, whereby the β-glucuronidase activity of the hyperacidified tumor cells causes deconjugation of the glucuronide compound at the site of the tumor cells and release of the aglycone thereat, the improvement wherein the tumor selectivity of the process is improved and the risk of deconjugtion of the glucuronide compound at the site of non-tumor tissues is diminished, comprising:

administering to the patient an alkalinizing agent in an amount sufficient to maintain the pH level of the non-tumor tissues of the patient at approximately 7.4 during the glucuronide treatment, and the improvement further comprising administering said glucuronide in an initial dosage of at least 2 mMols per kg of body weight but not exceeding the maximum safe toxicity dosage.

4,481,196

GLYCOSIDE PHOSPHATE DERIVATIVES, PHARMACEUTICAL COMPOSITION OF THE SAME AND METHOD OF USE

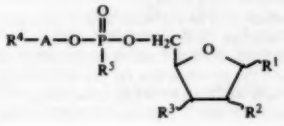
Tsutomu Teraji, Osaka; Eishiro Todo; Norihiko Shimazaki, both of Toyonaka; Teruo Oku, Osaka, and Takayuki Namiki, Minoo, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 31, 1983, Ser. No. 528,062

Int. Cl.^{3} A61K *31/70*; **C07H** *9/140, 15/02*

U.S. Cl. 424—180 **19 Claims**

1. A compound of the formula:



wherein

R^1, R^2, and R^3 are each hydroxy, alkoxy, alkanoylamino or protected hydroxy;

A is lower alkylene;

R^4 is alkylammonio, cyclic ammonio or cyclic amino; and

R^5 is oxido anion or hydroxy;

or a pharmaceutically acceptable salt thereof.

19. A method for treating fibrosarcoma Meth A which comprises administering a pharmaceutically effective amount of the compound of claim **1** to a subject in need of said treatment.

4,481,197

ANTI-INFLAMMATORY DEOXYRIBOSIDES

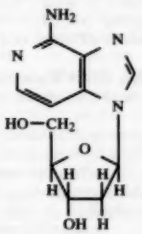
Janet L. Rideout, Raleigh, and Thomas A. Krenitsky, Chapel Hill, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 143,836, Apr. 25, 1980, Pat. No. 4,381,344. This application Jun. 17, 1982, Ser. No. 389,561

Int. Cl.[3] **A61K** *31/70*; **C07H** *17/00, 15/12*

U.S. Cl. 424—180 **11 Claims**

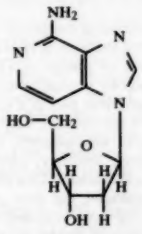
1. The compound of formula (I)



(I)

the 5'-phosphate ester thereof, organic esters of the compound or its 5'-phosphate ester with lower alkanoic or benzoic acid and pharmaceutically acceptable salts of the compound or its esters.

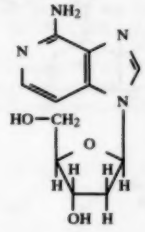
3. A method for the treatment of inflammation comprising the administration to a human or other mammal suffering from an inflammatory condition an effective anti-inflammatory, non-toxic amount of an active ingredient selected from the compound of formula (I)



(I)

the 5'-phosphate ester of said compound, organic esters of said compound or its 5'-phosphate ester with lower alkanoic or benzoic acid and pharmaceutically acceptable salts of said compound or its esters.

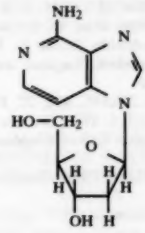
8. A method for the suppression of the immune response in a human or other mammal comprising the administration of an immune response suppressing non-toxic amount of an active ingredient selected from the compound of formula (I),



(I)

the 5'-phosphate ester of said compound, organic esters of said compound or its 5'-phosphate ester with lower alkanoic or benzoic acid and pharmaceutically acceptable salts of said compound or its esters.

11. A pharmaceutical formulation for use in treatment of inflammation or suppression of the immune response or both comprising an effective inflammation or immune response nontoxic treatment amount of an ingredient selected from the compound of formula (I)



(I)

the 5'-phosphate ester thereof, organic esters of the compound or its 5'-phosphate ester with lower alkanoic or benzoic acid and pharmaceutically acceptable salts of the compound or its esters and a pharmaceutically acceptable carrier therefore.

4,481,198

VITAMIN D METABOLISM INHIBITOR

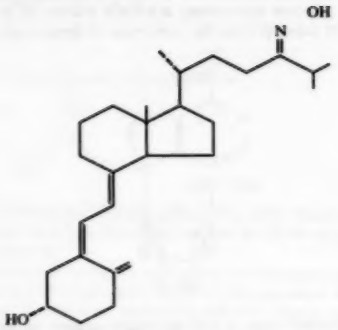
Hector F. DeLuca; Heinrich K. Schnoes, both of Madison, Wis.; John Y. Chu, Clinton, Miss., and Bruce D. Kabakoff, Bar Harbor, Me., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 13, 1984, Ser. No. 579,620

Int. Cl.[3] **A61K** *51/39*; **C07J** *9/00*

U.S. Cl. 424—236 **8 Claims**

1. The compound having the formula



in amorphous or crystalline form.

4. A method for treating hypercalcemic conditions which comprises administering an effective amount of the compound of claim 1.

4,481,199

1,2,4-TRIAZOLE-3-AMINE AND 1,2,4 TRIAZOLE-3,5-DIAMINE COMPOUNDS AND THEIR PHARMACEUTICAL USE

Linda Carey; Barry J. Price; John W. Clitherow; John Bradshaw; Michael Martin-Smith; David E. Bays, and Philip Blatcher, all of Hertfordshire, England, assignors to Glaxo Group Limited, England

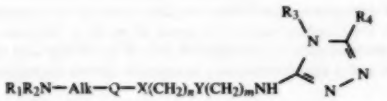
Continuation of Ser. No. 296,841, Aug. 27, 1981, abandoned. This application Jul. 6, 1983, Ser. No. 511,234

Claims priority, application United Kingdom, Aug. 27, 1980, 8027741

Int. Cl.[3] **A61K** *31/41*; **C07D** *405/12, 405/14*

U.S. Cl. 424—246 **11 Claims**

1. A compound of the formula (I)



and physiologically acceptable salts and hydrates thereof, in which

R_1 represents C_{1-14} alkyl, C_{3-8} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, aryl C_{1-6} alkyl, trifluoro C_{1-6} alkyl, heteroaralkyl wherein the heterocyclic portion is furyl, thienyl, pyrrolyl, pyridinyl, pyrimidinyl, triazinyl, oxazolyl, triazolyl or thiazolyl and the alkyl portion is a straight or branched C_{1-4} alkyl chain or C_{1-6} alkyl substituted by C_{3-8} cycloalkyl, hydroxy, C_{1-6} alkoxy, amino, C_{1-6} alkylamino or di C_{1-6} alkylamino; and

R_2 represents hydrogen or a C_{1-4} alkyl group; or R_1 and R_2 together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino, hexamethylenimino, heptamethylenimino, tetrahydropyridino, 4-hydroxypiperidino, 4-C_{1-3} alkylpiperidino, morpholino, 2,6-di-C_{1-3} alkylmorpholino or a thiamorpholino group;

Alk represents a straight or branched alkylene chain of 1 to 6 carbon atoms;

Q represents a furan or thiophen ring in which incorporation into the rest of the molecule is through bonds at the 2- and 5-positions, the furan or thiophen ring optionally bearing a further substituent R_5 adjacent to the group R_1R_2N-Alk-, or Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1- and 3- or 1- and 4-positions;

R_5 represents halogen or C_{1-4} alkyl which may be substituted by hydroxy or C_{1-4} alkoxy;

X and Y, which may be the same or different, each represent oxygen, sulphur, methylene or a bond;

n represents zero, 1, 2 and 3 and m represents an integer from 2 to 5 with the provisos that (a) the total number of atoms in the chain $X(CH_2)_nY(CH_2)_m$ is an integer from 3 to 8 and (b) when X and Y represent oxygen or sulphur then n is 2 or 3;

R_3 represents C_{1-6} alkyl, C_{3-6} alkenyl, aryl C_{1-6} alkyl, hydroxy C_{2-6} alkyl or C_{1-6} alkoxy-C_{2-6} alkyl; and

R_4 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, aryl C_{1-6} alkyl; acyloxy C_{1-6} alkyl wherein the acyl portion is aroyl, aryl C_{2-7} alkanoyl or C_{1-6} alkanoyl; C_{1-6} alkylthio C_{1-6} alkyl, arylthio C_{1-6} alkyl; aryloxy C_{1-6} alkyl, aryl C_{1-6} alkyloxy C_{1-6} alkyl; or the group $(CH_2)_qR_6$ where q is zero, 1, 2, 3, 4, 5 or 6 and the alkylene chain $(CH_2)_q$ may be straight or branched; and

R_6 ia hydroxy, C_{1-6} alkoxy, nitro, cyano; heteroaryl; or $CH_2NHC(=A)NHR_7$ where A is NCN, NSO_2 methyl, NSO_2 phenyl or $CHNO_2$, and R_7 is alkyl;

or R_6 is the group NR_8R_9 where R_8 is hydrogen or C_{1-6} alkyl; and R_9 is hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, aryl; aryl C_{1-6} alkyl or heteroaralkyl, or R_9 is the group SO_2R_{10} where R_{10} is C_{1-6} alkyl or aryl; or R_9 is the group COR_{11} where R_{11} is hydrogen, C_{1-6} alkyl, aryl; ar C_{1-6} alkyl; C_{1-6} alkoxy, halomethyl, heteroaryl; heteroaralkyl or the group NHR_{12} where R_{12} is hydrogen, C_{1-6} alkyl, C_{3-8} cycloalkyl, aryl; or aryl C_{1-6} alkyl; or R_8 and R_9 together represents the group $=CR_{13}R_{14}$ where R_{13} represents aryl; or heteroaryl, and R_{14} represents hydrogen or C_{1-6} alkyl;

or R_6 is the group SO_2R_{15} in which R_{15} is hydroxy, C_{1-6} alkyl, aryl; or the group $NR_{16}R_{17}$ where R_{16} and R_{17} which may be the same or different, each represent hydrogen or C_{1-6} alkyl;

or R_6 is the group COR_{18} where R_{18} is hydrogen, hydroxy, C_{1-6} alkoxy, aryloxy, aryl C_{1-6} alkoxy; C_{1-6} alkyl, aryl, or aryl C_{1-6} alkyl;

or the group $NR_{19}R_{20}$ where R_{19} is hydrogen or alkyl optionally substituted by a hydroxy or C_{1-6} alkoxy group; and R_{20} is hydrogen, C_{1-6} alkyl (optionally substituted by a hydroxy or C_{1-6} alkoxy group), C_{3-6} alkenyl, aryl, aryl C_{1-6} alkyl; or C_{3-8} cycloalkyl; or $NR_{19}R_{20}$ form a pyrrolidino, piperidino, hexamethylenimino, heptamethylenimino, tetrahydropyridino, 4-hydroxypiperidino, 4-C_{1-3} alkylpiperidino, morpholino, 2,6-di-C_{1-3} alkylmorpholino or a thiamorpholino group;

or R_6 is the group $CR_{21}{=}NR_{22}$ where R_{21} is hydrogen, C_{1-6} alkyl, aryl or aryl C_{1-6} alkyl, and R_{22} is hydroxy, C_{1-6} alkoxy, aryl C_{1-6} alkoxy or —NHC(=B)NH_2 where B is oxygen or sulphur;

with the proviso that when the group R_6 contains a carbon atom through which it is linked to the alkylene group $(CH_2)_q$ then the total number of carbon atoms in the resulting chain is not greater than 6 (i.e., q is not greater than 5);

or R_3 and R_4 together represent the group —CH=CH—$_2$ or —CH_2—$_4$; and wherein the term aryl as a group or part of a group means phenyl or phenyl substituted by one or more C_{1-3} alkyl or alkoxy groups or halogen atoms; the term heteroaryl as a group or part of a group unless otherwise stated means thienyl, pyridyl, furyl or thiazolyl; the heteroaryl ring may be unsubstituted or substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy, hydroxy C_{1-6} alkyl, amino C_{1-6} alkyl, C_{1-6} alkylamino C_{1-6} alkyl, di-C_{1-6} alkylamino C_{1-6} alkyl or halogen; the alkyl portion of a heteroalkyl group is a straight or branched C_{1-4} alkyl chain, and the heteroaryl ring is linked to the alkyl portion through either a carbon or nitrogen atom.

11. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as defined in claim 1 to relieve said condition.

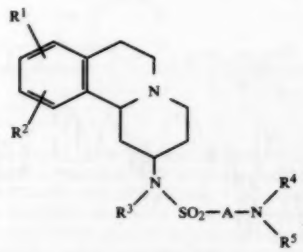
4,481,200

α_2-ADRENOCEPTOR ANTAGONISTIC BENZOQUINOLIZINES

Terence J. Ward, Slough, and John F. White, Wokingham, both of England, assignors to John Wyeth & Brother, Limited, Maidenhead, England

Filed Mar. 3, 1983, Ser. No. 471,960
Claims priority, application United Kingdom, Mar. 18, 1982, 82/07970
Int. Cl.³ A61K *31/535;* C07D *455/06*
U.S. Cl. 424—248.5 9 Claims

9. A method of antagonising α_2-adrenoceptors in warm blooded animals which comprises administering to the animal an effective amount of a compound selected from the group consisting of a benzoquinolizine of the formula



and a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 each represent hydrogen, lower alkyl, lower alkoxy or halogen, R^3 represents methyl or ethyl, A represents a direct bond between the S and N atoms or a lower alkylene group having 1 to 3 carbon atoms in the chain between the S and N atoms, R^4 and R^5 each independently represent hydrogen, lower alkyl, phenyl, phenyl loweralkyl, substituted phenyl or substituted phenyl loweralkyl wherein the phenyl substituents are selected from one or more of halogen, lower alkyl, lower alkoxy, lower alkylenedioxy, amino, mono- or di-lower alkylamino or trifluoromethyl, or R^4 and R^5 together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino or morpholino ring.

4,481,201

PHARMACEUTICAL COMPOSITION CONTAINING N,N³-DI-(β-BROMOPROPIONYL)-N¹,N²-DISPIRO-TRIPIPERAZINIUM DICHLORIDE

Margarita I. Dorokhova; Alla N. Zamskaya; Sofya M. Minakova; Tamara S. Safonova; Vladimir A. Chernov, all of Moscow, U.S.S.R.; Kira V. Levshina, deceased, late of Moscow, U.S.S.R.; Alexandr A. Mizeri, administrator, Moscow, U.S.S.R.; Olga Y. Tikhonova, deceased, late of Moscow, U.S.S.R., and Emilia F. Shardakova, administrator, Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Khimoko-Farmasevtichesky Institut Imeni S. Ordzhonikidze, U.S.S.R.

Filed Nov. 6, 1981, Ser. No. 318,973
Int. Cl.³ A61K *31/495*
U.S. Cl. 424—250 7 Claims

6. Method of treating acute leukemia, which comprises administering to a patient suffering from the same an acute leukemia treatment effective amount of N,N³-di-(β-bromopropionyl)-N¹,N²-dispirotripiperazinium dichloride.

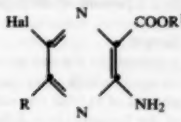
4,481,202

2-AMINO-3-CARBOXYLATE-5-HALO-6-(SUBSTITUTED)-PYRAZINE ANTIMICROBIAL COMPOUNDS

David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 27, 1982, Ser. No. 453,059
Int. Cl.³ C07D *241/02*
U.S. Cl. 424—250 10 Claims

1. A method of inhibiting the growth of bacteria and fungi comprising contacting said bacteria and fungi with a bactericidally and fungicidally effective amount of a compound of the formula:



(I)

wherein:
Hal is bromine or chlorine; and
R is halo; mono- or di-substituted mono- or diloweralkylamino wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; thiocyano; mercapto; straight or branched chain C_{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkanoylamino or loweralkoxycarbonyl; phenylthio; naphthylthio; biphenylthio; loweralkylsulfoxy; or loweralkylsulfonyl; and
R^1 is C_{6-12}alkyl.

4,481,203

COMPOSITION CONTAINING 1-(N-HEXYLCARBAMOYL)-5-FLUOROURACIL AND URACIL

Setsuro Fujii, Toyonaka; Norio Unemi, and Setsuo Takeda, both of Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

Division of Ser. No. 15,161, Feb. 13, 1979, Pat. No. 4,328,229, which is a continuation-in-part of Ser. No. 891,343, Mar. 29, 1978, abandoned. This application Dec. 3, 1980, Ser. No. 212,543
Claims priority, application Japan, Apr. 5, 1977, 52-39341; Feb. 10, 1978, 53-14676
Int. Cl.³ A61K *31/505*
U.S. Cl. 424—251 8 Claims

8. A method of delivering 5-fluorouracil to a cancer sensitive to 5-fluorouracil in a warm-blooded animal, the method comprising administering to the animal at least one 5-fluorouracil (a) and uracil (b) in separate doses, wherein the 5-fluorouracil (a) is 1-(n-hexylcarbamoyl)-5-fluorouracil wherein about 0.1 to about 10 moles of uracil (b) is used per mole of 5-fluorouracil (a), in an amount which is effective to deliver an anti-cancer effective amount of 5-fluorouracil to the cancer.

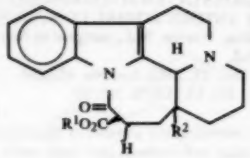
4,481,204

E-HOMO-EBURNANE DERIVATIVES, PROCESS FOR THEIR PREPARATION, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS

Csaba Szántay; Lajos Szabó; György Kalaus; János Sápi; Éva Pálosi; Egon Kárpáti, and László Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyár R.T., Budapest, Hungary

Filed Jun. 29, 1983, Ser. No. 509,150
Int. Cl.³ A61K *31/395;* C07D *471/22, 459/00, 461/00*
U.S. Cl. 424—262 6 Claims

1. A racemic or optically active E-homo-eburnane of the formula (I),



(I)

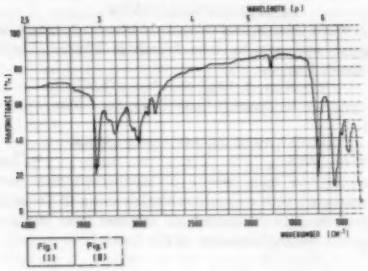
wherein

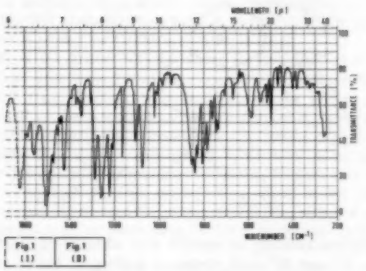
R^1 and R^2 independently represent an alkyl group having 1 to 6 carbon atoms,

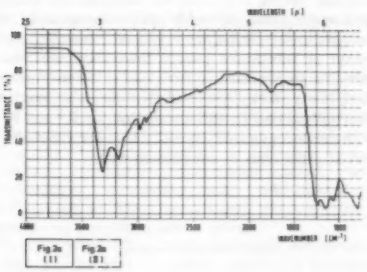
and acid addition salts thereof.

2. A pharmaceutical composition for use as an anti-depressant or as an anti-hypoxial agent which comprises: as an active ingredient an effective amount of at least one racemic or optically active compound of the formula (I) as defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof, in admixture with inert solid or liquid pharmaceutical carriers and/or additives.

19. A method of treating a patient requiring an antiphlogestic agent or an analgesic agent comprising administering an effective amount of the compound of claim 1.







4,481,205

2-AMINO-3-CARBETHOXYAMINO-6-(P-FLUORO-BENZYLAMINO)-PYRIDINE-MALEATE

Walter von Bebenburg, deceased, late of Dreieich, Fed. Rep. of Germany (by Marie von Bebenburg, administratrix), and Siegfried Pauluhn, Frankfurt am Main, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

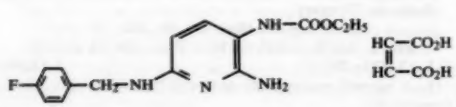
Filed Sep. 2, 1981, Ser. No. 298,886

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034638

Int. Cl.[3] **C07D** *213/75;* **A61K** *31/44*

U.S. Cl. 424—263 **22 Claims**

1. 2-amino-3-carbethoxyamino-6-(p-fluoro-benzylamino)-pyridine-maleate of the formula



4,481,206

SPIRO SUCCINIMIDE DERIVATIVE IN THE TREATMENT OF DEMENTIA OF THE ALZHEIMER TYPE

René Spiegel, Basel, and Hans Weidmann, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jun. 20, 1983, Ser. No. 505,717

Claims priority, application United Kingdom, Jun. 25, 1982, 8218424

Int. Cl.[3] **A61K** *31/445*

U.S. Cl. 424—267 **3 Claims**

1. A method for the treatment of Alzheimer's disease and dementia of the Alzheimer type which comprises administering to a subject in need of such treatment a therapeutically effective amount of spiro-(N'-methyl-piperidyl-4')-N-ethyl-succinimide or a pharmaceutically acceptable acid addition salt thereof admixed with a pharmaceutical carrier or diluent.

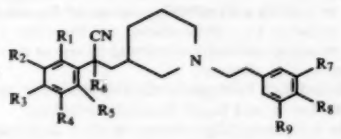
4,481,207
1-PHENETHYL-ALPHA-PHENYL-PIPERIDINE-3-PROPANENITRILES AND THEIR PHARMACEUTICAL USES

Philippe Manoury, Le Plessis Robinson; Jean Binet, Breuillet, and Gerard DeFosse, Paris, all of France, assignors to Synthelabo, Paris, France

Filed Aug. 15, 1983, Ser. No. 523,349
Claims priority, application France, Aug. 16, 1982, 82 14154
Int. Cl.³ A61K *31/445*; C07D *211/34*
U.S. Cl. 424—267 **9 Claims**

1. 1-Phenethyl-α-phenyl-piperidine-3-propane-nitriles, in the form of two pairs of diastereoisomers and/or in the form of enantiomers, corresponding to the general formula:

(I)



wherein R_1, R_2, R_3, R_4 and R_5 independently of one another each represent a hydrogen atom, a halogen atom, a (C_{1-4})alkoxy radical, a (C_{1-4})alkylthio radical, a halogeno(C_{1-4})alkyl radical, a (C_{1-4})alkyl radical or a cycloalkyl-alkoxy-alkoxy radical or two of the adjacent R symbols together form a methylenedioxy or ethylenedioxy radical, R_6 represents a hydrogen atom, a (C_{1-4})alkyl radical, a (C_{3-6})cycloalkyl radical or a (C_{3-6})cycloalkyl(C_{1-4})alkyl radical, and R_7, R_8 and R_9 independently of one another each represent a hydrogen atom or a methoxy radical, and pharmaceutically acceptable acid addition salts thereof.

9. A method for the treatment of a patient requiring an antihypertensive medicament which comprises administering to the patient an amount of a compound as claimed in claim 1, or a pharmaceutically-acceptable acid addition salt thereof, sufficient to ameliorate the condition of the patient.

4,481,208
TREATMENT OF PANIC DISORDERS WITH ESTAZOLAM

James H. Coleman, Cumberland, R.I., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 6, 1983, Ser. No. 499,442
Int. Cl.³ A61K *31/41*
U.S. Cl. 424—269 **10 Claims**

1. A process for preventing or treating panic attacks comprising the administration to a human subject, in need of such treatment in unit dosage form, from about 0.01 mg to about 0.4 mg/kg body weight of 8-chloro-6-phenyl-4H-s-triazolo[4,3-a][1,4]benzodiazepine or the pharmacologically acceptable acid addition salt or a (5) N-oxide thereof in association with a pharmaceutical carrier.

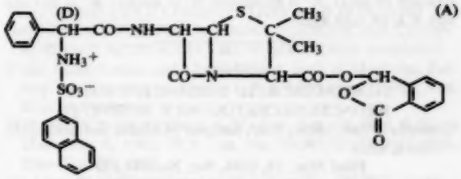
4,481,209
PENICILLIN SALT

Kenneth Utting, Lower Kingswood; Karrar A. Khan, and Sidney E. Callander, both of Worthing, all of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 25,662, Mar. 30, 1979, abandoned. This application Nov. 7, 1980, Ser. No. 204,845
Claims priority, application United Kingdom, Apr. 1, 1978, 12823/78
Int. Cl.³ A61K *31/43*; C07D *499/32*
U.S. Cl. 424—271 **8 Claims**

1. Ampicillin phthalidyl ester naphthalene 2-sulphonate of the formula (A):

(A)



2. A pharmaceutical composition of improved taste and palatability having the anti-infective activity of ampicillin, which upon ingestion provides biological availability of ampicillin, which composition comprises an effective amount of ampicillin phthalidyl ester naphthalene-2-sulphonate sufficient to produce a high serum concentration of ampicillin and a pharmaceutically acceptable carrier.

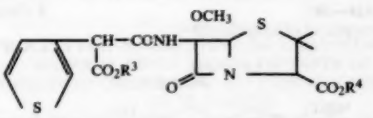
4,481,210
METHOD OF TREATMENT

Robert Sutherland, Dorking, and Brian Slocombe, Ewhurst, both of England, assignors to Beecham Group p.l.c., England

Filed Mar. 30, 1982, Ser. No. 363,487
Claims priority, application United Kingdom, Apr. 15, 1981, 8111939
Int. Cl.³ A61K *31/43*
U.S. Cl. 424—271 **4 Claims**

1. A method of treating bacterial infections in humans which comprises parenterally administering to a human in need thereof one or two unit dosages, each of which comprises 1000 mg of a compound of the formula (II):

(II)



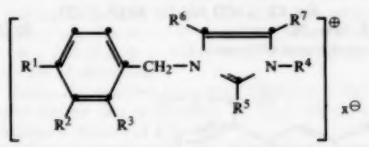
wherein R^3 and R^4 are both sodium, in combination with a pharmaceutically acceptable carrier.

4,481,211
MICROBIOCIDAL SUBSTITUTED BENZYLIMIDAZOLIUM SALTS

Toni Dockner, Meckenheim; Ernst-Heinrich Pommer, Limburgerhof, and Matthias Wetzler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Claims priority, application Fed. Rep. of Germany Nov. 20, 1981, 3145927; Nov. 20, 1981, 3145928
Filed Nov. 15, 1982, Ser. No. 441,803
Int. Cl.³ A01N *43/50*; C07D *233/00*
U.S. Cl. 424—273 R **5 Claims**

5. A process for combating microbes, wherein the microbes, or the articles to be protected from attack by microbes, are treated with an effective amount of an N-benzylimidazolium salt of the formula



where R^1 and R^2 are identical or different and each denotes hydrogen or chlorine; R^3 is methyl; R^4 is alkyl of 8 to 14 carbon atoms or benzyl which is unsubstituted or substituted by

halogen or alkyl, R^5 is hydrogen, R^6 is methyl; R^7 is halogen and X is an acid anion.

4,481,212

THIOLACTIC ACID DERIVATIVE WITH BRONCHOSECRETOGOGUE ACTIVITY

Graziella Bruno, Milan, Italy, assignor to Medea Research s.r.l., Milan, Italy

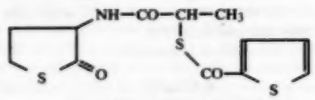
Filed Mar. 13, 1984, Ser. No. 588,953

Claims priority, application Italy, Mar. 23, 1983, 20236 A/83

Int. Cl.³ A61K *31/38;* **C07D** *333/00*

U.S. Cl. 424—275 **3 Claims**

1. 2-(2-Thenoylthio)-N-(2',3',4',5'-tetrahydro-2'-oxo-thiophen-3'-yl)-propionylamide having formula I



I

4,481,213

4-HALOALKYLAMINO SUBSTITUTED CHROMANOL USEFUL AS ANTIHYPERTENSIVE AGENT

John M. Evans, Roydon, England, assignor to Beecham Group Limited, England

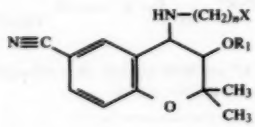
Continuation of Ser. No. 295,134, Aug. 21, 1981, abandoned. This application Jul. 15, 1982, Ser. No. 398,553

Claims priority, application United Kingdom, Aug. 21, 1980, 8027204

Int. Cl.³ A61K *31/35;* **C07D** *311/02*

U.S. Cl. 424—283 **8 Claims**

1. A compound of formula (I):



(I)

and pharmaceutically acceptable salts thereof wherein R_1 is hydrogen or C_{1-6} alkyl or carboxylic acyl of 1 to 8 carbon atoms; n is 2, 3 or 4; X is halogen; and the OR_1 and $HN(CH_2)_nX$ moieties are trans.

7. A method of treatment of hypertension, which method comprises the administration to the sufferer of an effective amount of a compound according to claim 1.

4,481,214

4-ACYLAMINOBENZOPYRANS USEFUL AS ANTI-HYPERTENSIVE AGENTS

John M. Evans, Roydon, England, assignor to Beecham Group p.l.c., England

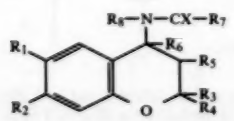
Filed May 19, 1983, Ser. No. 496,174

Claims priority, application United Kingdom, May 21, 1982, 8214821; Jan. 15, 1983, 8301088

Int. Cl.³ C07D *311/02;* **A61K** *31/35*

U.S. Cl. 424—283 **20 Claims**

1. A compound of formula (I):



(I)

wherein:

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphionyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, C_{1-6} alkyl-thiolmethyl, formyl or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or $—C(C_{1-6}$ alkyl)-NOH or $—C(C_{1-6}$ alkyl)NNH_2, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 are C_{2-5} polymethylene;

either R_5 is hydroxy, C_{1-6} alkoxy or C_{2-7} unsubstituted carboxylic acyloxy and R_6 is hydrogen or R_5 and R_6 together are a bond;

R_7 is hydrogen, C_{1-6} alkyl or C_{2-6} alkenyl;

R_8 is hydrogen or C_{1-6} alkyl; and

X is oxygen or sulphur; the $R_8—N—CX—R_7$ group being trans to the R_5 group when R_5 and R_6 together are not a bond; or, when one or the other of R_1 and R_2 is an amino or an amino-containing group, a pharmaceutically acceptable salt thereof.

20. A method of treating hypertension in mammals including man, which comprises administering to the hypertensive mammal an anti-hypertensive effective amount of a compound of formula (I), as defined in claims 1.

4,481,215

INSECTICIDAL COMPOSITIONS HAVING HIGH CONCENTRATION OF ACTIVE INGREDIENTS

Stanley Tocker, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 387,742, Jun. 11, 1982, abandoned. This application Apr. 18, 1983, Ser. No. 483,726

Int. Cl.³ A01N *37/00*

U.S. Cl. 424—298 **12 Claims**

1. An insecticidal composition consisting essentially of

(1) methomyl;

(2) a reaction product of formaldehyde or paraformaldehyde and methomyl, wherein the weight ratio of reaction product to unreacted methomyl is from about 1.5:1 to about 20:1; and

(3) 5–35% by weight, based on the weight of the composition, of water.

4,481,216

CONTROL OF CORN ROOTWORM BY APPLICATION OF N-METHYL 2-(1-METHYLETHYL)PHENYLCARBAMATE

Winchester L. Hubbard, Woodbridge, and Richard C. Moore, Wallingford, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Oct. 7, 1983, Ser. No. 540,571

Int. Cl.³ A01N *47/10*

U.S. Cl. 424—300 **2 Claims**

1. A method for controlling corn rootworm by contacting said corn rootworm with at least 1 ppm of N-methyl 2-(1-methylethyl)phenylcarbamate.

4,481,217

α,β-DIHYDROPOLYPRENYL DERIVATIVES USEFUL IN TREATING HEPATITIS

Isao Yamatsu, Kawaguchi; Yuichi Inai; Shinya Abe, both of Tokyo; Hideaki Watanabe, Aichi; Toshiji Igarashi, Tokorozawa; Hiroyuki Shiojiri, Sayama; Yoshio Tanabe, Saitama, and Kuniko Hara, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

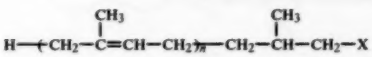
Filed May 28, 1981, Ser. No. 269,930

Claims priority, application Japan, May 30, 1980, 55-71488; May 30, 1980, 55-71489

Int. Cl.³ C07C *69/587;* A61K *31/22, 31/23*

U.S. Cl. 424—311 2 Claims

1. A method for treating liver hepatitis which comprises administering to a patient afflicted with liver hepatitis a pharmacological composition comprising a therapeutically effective amount of a compound having the formula:



wherein X is —COOR$_1$ or —CH$_2$OR$_2$, in which R$_1$ is hydrogen or a lower alkyl group and R$_2$ is hydrogen or aliphatic acyl having one to four carbon atoms; and n is an integer of one to four, in combination with a pharmacological carrier.

4,481,218

3-(2,2,2-TRIMETHYLHYDRAZINIUM)PROPIONATE AND METHOD FOR THE PREPARATION AND USE THEREOF

Anatoly Eremeev, Riga; Ivars Y. Kalvinsh, Salaspils; Valentina G. Semenikhina; Edvards E. Liepinsh, both of Riga; Yan Y. Latvietis; Paul P. Anderson, both of Elgava; Elena B. Astapenok; Yazep Y. Spruzh, both of Riga; Petr T. Trapentsiers, Elgava; Gennady I. Podoprigora, Moscow, all of U.S.S.R., and Solomon A. Giller, deceased, late of Riga, U.S.S.R. (by Ida I. Khiller, administratrix.), assignors to Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi SSR, U.S.S.R.

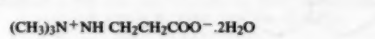
Continuation of Ser. No. 194,295, filed as PCT SU 79/00060, Jul. 27, 1979, published as WO 80/01068, May 29, 1980 § 102(e) date Jul. 25, 1980, This application Jul. 8, 1982, Ser. No. 396,490

Claims priority, application U.S.S.R., Nov. 27, 1978, 2715660

Int. Cl.³ C07D *29/12;* C01B *25/16;* E05B *63/14*

U.S. Cl. 424—316 6 Claims

1. 3-(2,2,2-Trimethylhydrazinium)-propionate of the formula:



(1)

4,481,219

INHIBITION OF GROWTH IN FUNGI

Sarah C. Watkinson, Bladon, England, assignor to National Research Development Corporation, London, England

Filed Jul. 7, 1982, Ser. No. 395,928

Claims priority, application United Kingdom, Jul. 16, 1981, 8121918; Dec. 8, 1981, 8136944

Int. Cl.³ A01N *37/12*

U.S. Cl. 424—319 35 Claims

1. A composition, comprising:

(a) a nitrogenous compound selected from a group consisting of DL methionine sulfoxide, δ-hydroxylysine.HCL, aminoisobutyric acid, alkali metal salts thereof, acid-addition salts thereof, and mixtures thereof, in an amount effective for inhibiting the growth of timber fungus; and

(b) a second compound selected from the group consisting of monosaccharides, disaccharides, polysaccharides or mixtures thereof in an amount effective for promoting the uptake of the nitrogenous compound.

4,481,220

WATER-SOLUBLE COMPOSITION FOR FORMING AN AQUEOUS ISOTONIC NITROGLYCERINE SOLUTION AND THE NITROGLYCERINE SOLUTION FORMED

Ewald Giesselmann, and Ulrich Münch, both of Monheim, Fed. Rep. of Germany, assignors to Sanol Schwarz GmbH, Fed. Rep. of Germany

PCT No. PCT/DE82/00054, § 371 Date Sep. 29, 1982, § 102(e) Date Nov. 8, 1982, PCT Pub. No. WO82/03172, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 12, 1982, Ser. No. 438,887

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109783

Int. Cl.³ A61K *31/04*

U.S. Cl. 424—349 7 Claims

1. An approximately isotonic aqueous nitroglycerine solution, free of ethanol and containing

(a) approximately 1 mg of nitroglycerine/ml of solution,

(b) a solubiliser for parenteral administration selected from the group consisting of polyvalent, lower and higher alcohols, lower and higher ether alcohols and amides or organic acids, and

(c) a nitroglycerine carrier selected from the group consisting of sodium chloride, mannitol, sorbitol, glucose, lactose and levulose and mixtures thereof, and having a weight ratio of nitroglycerine:solubiliser of from 0.1:1 to 10:1, and having an amount of carrier which supplements the total amount of all the substances in an amount of preparation containing approximately 0.1 g of nitroglycerine to the isotonicity equivalent corresponding to approximately 0.90 g of sodium chloride prepared by dissolving a mixture of (a), (b) and (c) in water at a temperature of at least 60° to 100° C.

4,481,221

PROCESS FOR AUGMENTING OR ENHANCING THE TROPICAL FRUIT AROMA OR TASTE OF A FOODSTUFF OR CHEWING GUM USING A MIXTURE OF ALCOHOLS

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Robin K. Wolff, Point Pleasant; Richard M. Boden, Ocean, and Takao Yoshida, West Long Branch, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 496,664, May 20, 1983, Pat. No. 4,425,365, which is a division of Ser. No. 396,485, Jul. 8, 1982, Pat. No. 4,424,378, which is a continuation-in-part of Ser. No. 362,237, Mar. 26, 1982, Pat. No. 4,428,387. This application Sep. 14, 1983, Ser. No. 531,999

Int. Cl.³ A23L *1/235*

U.S. Cl. 426—3 1 Claim

1. A process for augmenting or enhancing the aroma or taste of a mango, papaya or guava flavored foodstuff or chewing gum comprising the step of adding to said foodstuff or chewing gum from 0.02 parts per million up to about 300 parts per million based on total composition of a mixture of alcohols prepared according to the process consisting essentially of the steps of:

1. reacting alpha pinene with an equimolar mixture of carbon monoxide and hydrogen at a pressure of 4,000 psig and a temperature in the range of 200°–220° C. whereby a mixture of aldehydes is formed;
2. distilling the mixture of aldehydes at a vapor temperature in the range of from 85° C. up to 93° C. and a pressure of from 3 mm/Hg. up to 4 mm/Hg., thereby recovering a mixture of aldehydes;
3. reacting the resulting mixture of aldehydes with methyl ethyl ketone at a temperature of about 45° C. thereby forming a mixture of ketones;
4. distilling the resulting mixture of ketones at a vapor temperature in the range of from 69° C. up to 89° C. and a pressure in the range of from 1.4 up to 1.8 mm/Hg. thereby recovering a mixture of ketones; and

5. reacting the resulting mixture of ketones with lithium aluminum hydride; then
6. fractionally distilling the resulting mixture at a vapor temperature in the range of from 50° C. up to 122° C. and a pressure in the range of from 1 up to 2 mm/Hg. and recovering the distillation product, a mixture of alcohols.

4,481,222

DRY MIX FOR BREAD

Steve T. Fan, Maple Grove, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 452,692, Dec. 23, 1982, , which is a continuation-in-part of Ser. No. 287,457, Jul. 27, 1981, Pat. No. 4,395,426. This application Sep. 26, 1983, Ser. No. 536,075
The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.
Int. Cl.³ A21D *10/00*
U.S. Cl. 426—62 **15 Claims**

1. A dry mix for preparing bread without requiring a kneading step, said mix comprising:
   A. flour having an average vital gluten content of at least 5% by weight;
   B. about 1 part to 10 parts by weight of a chemical leavening agent per 100 parts flour;
   C. about 0.3 parts to 2.8 parts by weight per 100 parts of flour of a propylene glycol alginate; and
   D. about 0.7 parts to 4.15 parts of a gum member by weight per 100 parts of flour selected from the group consisting of karaya gum, guar gum, xanthan gum, carboxymethyl cellulose, carrageenan gum, and mixtures thereof.

4,481,223

DECAFFEINATION WITH TREATED ACTIVATED CARBON

David C. Hinman, Tarrytown, and Fouad Z. Saleeb, Pleasantville, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,498
Int. Cl.³ A23F *5/22*
U.S. Cl. 426—422 **9 Claims**

1. A method of decaffeinating an aqueous coffee extract which comprises:
   (a) contacting activated carbon with a solution of ethyl cellulose to adsorb the ethyl cellulose on said activated carbon;
   (b) separating the ethyl cellulose-containing activated carbon from said solution;
   (c) contacting the ethyl cellulose-containing activated carbon with an aqueous coffee extract for a sufficient period of time to remove a substantial portion of the caffeine from said extract; and
   (d) separating the activated carbon from the substantially decaffeinated aqueous coffee extract.

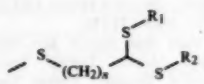
4,481,224

FLAVORING WITH ALKYLTHIOALKANAL DIALKYL MERCAPTALS

Ranya Muralidhara, Fair Haven; Alan O. Pittet, Atlantic Highlands; Manfred H. Vock, Locust, and David R. Bowen, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

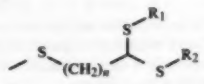
Filed Aug. 8, 1983, Ser. No. 521,321
Int. Cl.³ A23L *1/226, 1/235*
U.S. Cl. 426—535 **7 Claims**

1. The process for augmenting or enhancing the aroma or taste of a foodstuff comprising adding to said foodstuff from 0.0003 parts per million up to about 300 parts per million based on total composition of at least one dialkyl mercaptal of a methylthioalkanal defined according to the structure:



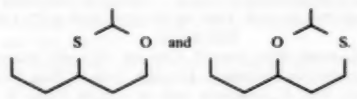
wherein n is an integer of from 1 to 3 and R_1 and R_2 are each the same or different and each represents C_1–C_3 lower alkyl.

7. The process of claim 1 wherein the compound having the structure:

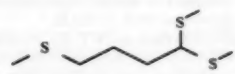


is a compound of the structure:

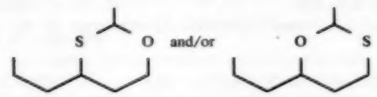
and intimately admixed therewith is at least one oxathiane defined according to a structure selected from the group consisting of:



the mole ratio of compound having the structure:



to oxathiane defined according to one of the structures:



being from about 1:10 down to about 10:1.

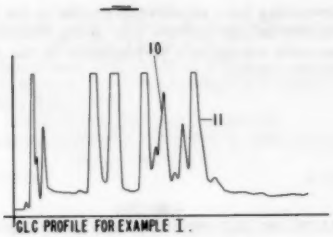
4,481,225

FLAVORING WITH A 1-HYDROXYMETHYL-2-ACYL CYCLOPROPANE DERIVATIVE

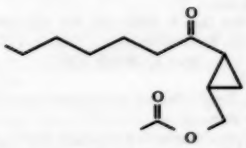
Richard M. Boden, Ocean; Marie R. Hanna, Hazlet, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 422,486, Sep. 23, 1982, Pat. No. 4,435,428. This application Nov. 30, 1983, Ser. No. 556,694
Int. Cl.³ A23L *1/226, 1/235*
U.S. Cl. 426—538 **1 Claim**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 0.02 ppm up to about 50 ppm based on the foodstuff composition of a compound having the structure:



GLC PROFILE FOR EXAMPLE I.



4,481,226

STABILIZED ANTHOCYANIN FOOD COLORANT

Wayne H. Crosby, Tarrytown; Charles V. Fulger, Millwood, both of N.Y.; Gerhard J. Haas, Woodcliff Lake, N.J., and Donna M. Nesheiwat, Yonkers, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 31, 1982, Ser. No. 363,973
Int. Cl.³ A23L 1/272
U.S. Cl. 426—540 5 Claims

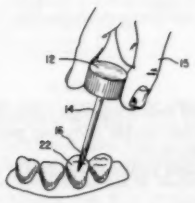
1. A stabilized anthocyanin grape extract colorant comprising an anthocyanin grape extract colorant combined with tannic acid wherein said tannic acid is present in an amount of from 5 to 25% by weight based on the solid contents of said grape extract colorant; wherein said colorant is a spray-dried particulate product further comprising a spray-drying carrier present in an amount of 25 to 75% by weight; and wherein said colorant is color stabilized against sunlight and heat.

4,481,227

METHOD OF COLORING BAKEABLE PORCELAIN DENTAL RESTORATIONS

Asami Tanaka, 9307 N. Lavergne, Skokie, Ill. 60077

Continuation of Ser. No. 186,757, Sep. 12, 1980, abandoned. This application Nov. 1, 1982, Ser. No. 438,252
Int. Cl.³ A61C 5/10
U.S. Cl. 427—2 25 Claims



1. A method of coloring the porcelain of bakeable porcelain dental restorations, comprising:

(a) providing cureable coloring solutions for application to the non-metallic porcelain portion of said restoration, each solution comprising a different color pigment of low temperature porcelain-fuseable powder and a substantially clear vaporizable cureable carrier liquid to support a dispersion of said pigment, said carrier liquid being impervious to water or saliva when cured;

(b) coating at least a portion of said porcelain restoration with a film of one of said coloring solutions to closely match the color of said restoration to the color of a patient's existing tooth;

(c) curing said film at non-elevated temperatures on said porcelain restoration prior to the application of a subsequent film, said cured film being substantially clear, dry, impervious to water or saliva, undisturbed by handling and capable of being recoated without disturbing earlier applied and cured coats;

(d) recoating at least a portion of said previously applied and cured film with a predetermined number of said coloring solutions until a desired coloration is obtained, each film recoating being cured prior to the application of a subsequent film coating whereby each previous film coating is not disturbed by a subsequent film coating; and

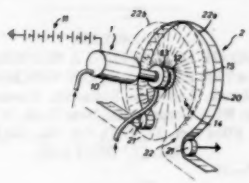
(e) baking said restoration with said predetermined number of films thereon at a temperature sufficiently high to vaporize said carrier liquid and to fuse said pigment to said restoration, thereby permanently coloring said restoration.

4,481,228

ELECTROSTATIC PAINTING METHOD AND APPARATUS

Jean Morel, Grenoble, France, assignor to Sames, S.A., Meylan, France

Filed Apr. 13, 1982, Ser. No. 367,884
Claims priority, application France, Apr. 17, 1981, 81 07810
Int. Cl.³ B05D 1/04, 5/02, 1/28
U.S. Cl. 427—31 14 Claims



1. A method for electrostatically painting small elongate objects which extend along a principal axis wherein said objects are disposed on respective individual rotary supports of a transporter performing a loop which is almost closed, the axis of said loop being parallel to the rotation axes of said rotary supports, whereby said objects rotate about their respective axes and move over a part-cylindrical surface delimited by two circles coaxial with said loop, said objects move around a paint sprayer comprising a bowl which is rotated at high speed and maintained at a high voltage relative to said transporter, said sprayer producing a thin sheet of atomized paint substantially in the form of a body of revolution about the rotation axis of said bowl, said bowl being disposed substantially on the axis of said loop with its axis of rotation aligned so that the area in which said sheet of atomized paint intersects the cyclinder defined by the axes of said objects is contained between but reaches as far as said circles delimiting said part-cylindrical surface, comprising:

(a) providing an annular nozzle disposed behind said bowl for directing an annular jet onto said thin sheet of atomized paint; and

(b) periodically modulating the feed pressure of a pressurized gas source to cause the intersection area between the paint sheet and said part-cylindrical surface to reach each said delimiting circle alternately, the period of modulation being less than the time required for said objects to pass once around said loop.

4,481,229

METHOD FOR GROWING SILICON-INCLUDING FILM BY EMPLOYING PLASMA DEPOSITION

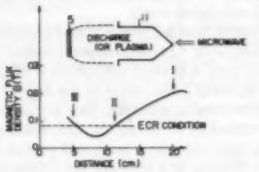
Keizo Suzuki, Hachioji; Atsushi Hiraiwa, Kodaira; Shigeru Takahashi, Hachioji; Shigeru Nishimatsu, Kokubunji; Ken Ninomiya, Tokyo, and Sadayuki Okudaira, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,719

Claims priority, application Japan, Jun. 25, 1982, 57/108336

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—38 **15 Claims**



1. A method for growing a silicon-including film comprising the steps of:

holding a substrate within a vacuum chamber;

forming a magnetic field in said vacuum chamber;

introducing, as a discharge gas, one of a hydrogen-free halogenide silicon gas or a gas mixture containing a hydrogen-free halogenide silicon gas in said vacuum chamber; and

supplying a microwave power to said vacuum chamber to form a plasma and deposit a silicon-including film by plasma deposition, whereby a hydrogen-free silicon-containing film can be grown on said substrate.

4,481,230

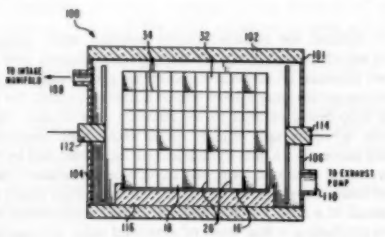
METHOD OF DEPOSITING A SEMICONDUCTOR LAYER FROM A GLOW DISCHARGE

Joseph J. Hanak, Lawrence Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,047

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—39 **10 Claims**



1. In a method of depositing a layer of an amorphous semiconductor material from a gas in the positive column of a glow discharge, which method comprises the steps of:

depositing an electrically conducting layer onto a surface of an insulating substrate; and

positioning the substrate in a chamber of a plasma reactor with the plane of the electrically conducting layer substantially parallel to the axis of the positive column;

the improvement comprising:

subdividing the electrically conducting layer into a plurality of electrically isolated segments with dividers therebetween; and

positioning the substrate with the segmented electrically conducting layer in the chamber with the plane of said conducting layer substantially parallel to the axis of the positive column and the axes of the dividers between segments substantially perpendicular to the axis of the positive column.

4,481,231

METHOD FOR PRODUCTION OF MAGNETIC RECORDING MEDIA

Hiroshi Hashimoto; Tsutomu Okita, and Noburo Hibino, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 8, 1983, Ser. No. 559,534

Claims priority, application Japan, Dec. 8, 1982, 57-215992

Int. Cl.³ H01F *10/02*

U.S. Cl. 427—44 **10 Claims**

1. A method for producing a magnetic recording medium, comprising the steps of:

coating a support base with a magnetic coating composition, wherein the support base has a percent thermal shrinkage in the direction corresponding to the longitudinal direction of the support base of not more than 0.15% and further wherein the magnetic coating composition contains a compound having not less than two acrylate groups or methacrylate groups per molecule, and a ferromagnetic fine powder dispersed therein; and

irradiating the coated support base with an electron beam.

4,481,232

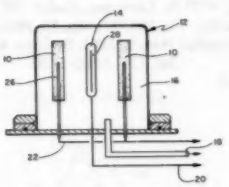
METHOD AND APPARATUS FOR PRODUCING HIGH PURITY SILICON

Jerry M. Olson, Lakewood, Colo., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 27, 1983, Ser. No. 498,999

Int. Cl.³ B05D *3/14;* **C23C** *11/00;* **C01B** *33/02*

U.S. Cl. 427—51 **21 Claims**



1. A method for producing high purity silicon comprising:

forming a copper silicide alloy and positioning said alloy within an enclosure;

placing a filament member within said enclosure opposite said alloy;

filling said enclosure with a chemical vapor transport gas adapted for transporting silicon; and

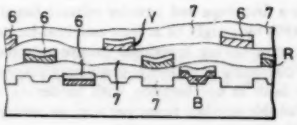
heating said filament member and said alloy to temperatures sufficient to cause said gas to react with silicon at said alloy surface and deposit said reactive silicon onto said filament member, said alloy being heated to said temperatures sufficient to enable said alloy to diffusionally trap impurities while said gas reacts with said silicon to effect depositing said silicon onto said filament member.

4,481,233

PROCESS FOR PRODUCING SOLID-STATE COLOR IMAGE PICKUP ARRAY

Hajime Sakata, Tokyo; Kojiro Yokono, Yokohama, and Seiichi Takahashi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1983, Ser. No. 466,839
Claims priority, application Japan, Feb. 23, 1982, 57-27785
Int. Cl.³ B05D 5/06
U.S. Cl. 427—68 4 Claims



1. A process for producing a solid-state color pickup array, which comprises:

(a) forming a resist mask on a wafer having a solid-state image pickup array wherein the portion of the wafer having the resist mask formed thereon is the unexposed portion of the wafer and the remainder of the wafer is the exposed portion;

(b) vapor-depositing a colorant on the exposed wafer and on the resist mask on the wafer; and

(c) removing by dissolution the resist mask thereby also eliminating the portion of the colorant film vapor-deposited on the resist mask.

4,481,234

PROCESS FOR MAKING PRIMED POLYMER SURFACES AND CHARGE TRANSFER MEDIA HAVING CONDUCTIVITY SITES THEREON

Vasant V. Kolpe, St. Paul; Dudley M. Sherman, Woodbury; William A. Hendrickson, St. Paul, and Hsin-hsin Chou, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 3, 1982, Ser. No. 345,402
Int. Cl.³ B05D 5/12
U.S. Cl. 427—71 14 Claims

1. A process for improving the surface properties of a solid substrate by increasing the electrostatic charge transfer efficiency of the surface or by increasing its priming according to ANSI/ASTM D 903-49 consisting essentially of depositing a material different from that of the substrate and having a bulk resistivity of less than 1×10^{18} ohm-cm onto at least one surface of a solid substrate by a process selected from the group consisting of radio frequency sputtering, vapor deposition, chemical vapor deposition, thermal evaporation, A.C. sputtering, D.C. sputtering, electroless deposition and drying of gels so as to form uncoated discrete sites of an inorganic material on said at least one surface, said discrete sites having average length of between 1.0 and 20.0 nm and covering between 0.1 and 40% of said surface.

4,481,235

APPARATUS AND METHOD FOR MANUFACTURING TAPE-SHAPED SILICON BODIES FOR SOLAR CELLS

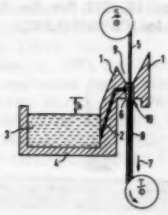
Helmut Foell; Bernhard Freienstein; Karl Geim, all of Munich; Josef Grabmaier, Berg, and Otmar Hintringer, Putzbrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,678
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240245
Int. Cl.³ B05D 5/12, 1/18; B05C 3/12
U.S. Cl. 427—74 5 Claims

1. An apparatus for manufacturing tape-shaped silicon bodies comprising:

a vat for holding molten silicon therein,

a vertically disposed drawing nozzle located outside the confines of said vat and above the level of molten silicon in said vat, said drawing nozzle including two lips which define a vertical slot therebetween, said lips being of different widths, capillary means arranged to deliver molten silicon from said vat into said drawing nozzle to fill the same with molten silicon, and



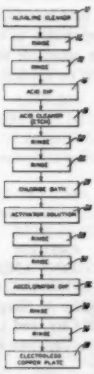
means for drawing a reticulate tape-shaped carrier body downwardly through the molten silicon contained in said drawing nozzle.

4,481,236

LIFE EXTENSION OF CATALYST PREDIP BATHS

Robert B. Forsterling, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1983, Ser. No. 490,313
Int. Cl.³ C23C 3/02
U.S. Cl. 427—97 2 Claims



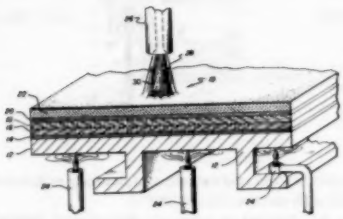
2. In a process for electroless copper plating of passage walls through the thickness of an electronic circuit board after etching at least one copper film thereon, which method includes immersing the circuit board in an acidic sodium chloride bath immediately prior to immersing the circuit board in a catalyst bath containing a palladium colloid and tin chloride, the improvement wherein the lifetime of the acidic bath containing sodium chloride is extended by recirculating the latter bath through a filter bag containing one or more pieces of metallic tin, the filter bag having openings therein not greater than about 50 microns in maximum dimension, whereby at least some of the copper ions, that might otherwise build up in the latter bath and contaminate the catalyst bath by drag-out, are precipitated within the filter bag as particles generally larger than 50 microns and thus restrained from transferring over into the next following catalyst bath.

4,481,237

METHOD OF APPLYING CERAMIC COATINGS ON A METALLIC SUBSTRATE

George S. Bosshart, Vernon, and Alfred P. Matarese, North Haven, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1981, Ser. No. 330,401
Int. Cl.[3] B05D *3/02*
U.S. Cl. 427—376.4 6 Claims



1. A method for applying a ceramic coating layer to a metallic substrate including the application of first a metallic bond layer and subsequently one or more graded interlayers of metallic/ceramic material between the metallic substrate and the ceramic coating layer wherein the improvement comprises:

controlling the metallic substrate temperature during the interlayer and ceramic deposition steps such that the temperature of the substrate at initial deposition of the material comprising each interlayer is greater than or equal to the temperature of the substrate at final deposition of the material comprising the prior applied layer, and such that the temperature of the substrate at final deposition of the material comprising said interlayer is lower than the temperature at initial deposition of that interlayer and lower than or equal to the substrate temperature at which the subsequent layer is to be applied.

4,481,238

BONDING COMPOSITIONS AND SHAPED ARTICLES UTILIZING THE BONDING COMPOSITIONS

David R. Fagerburg; Freddie A. Shepherd, both of Kingsport; Jenny W. Wright, Bluff City, and I. Daniel Sand, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1983, Ser. No. 496,343
Int. Cl.[3] B32B *15/08*
U.S. Cl. 428—35 18 Claims

1. A bonding composition for bonding polyesters and copolyesters to poly(vinyl alcohol) and copolymers thereof, said composition comprising a poly(esteramide) having an inherent viscosity of at least 0.45 dl/g, said poly(esteramide) containing

(1) repeating units from at least 80 mol percent of a dicarboxylic acid selected from pimelic, azelaic, sebacic acid or combinations thereof and optionally up to 20 mol percent of a second linear aliphatic dicarboxylic acid having at least four carbon atoms connected linearly between the two acid groups or an aromatic discarboxylic acid;

(2) repeating units from 5 mol percent to 20 mol percent of 1,2-ethanediamine, and

(3) repeating units from 95 to 80 mol percent of a glycol selected from ethylene glycol, 1,4-butanediol, 1,4-cyclohexanedimethanol or combinations thereof.

4,481,239

PROCESS FOR COATING METALLIC SUBSTRATES, AND USE OF THE PRODUCTS PREPARED IN THIS PROCESS

Günter Eckner, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 4, 1983, Ser. No. 520,162
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 3229563
Int. Cl.[3] B32B *1/08*; B05D *3/02*
U.S. Cl. 428—36 16 Claims

1. A process for coating metallic substrates which comprises applying in a first stage and powder mixture based on

(A) 10–45% by weight of at least one heat-hardenable synthetic resin having functional groups selected from the group consisting of hydroxyl-containing polyesters, epoxy resins, both in combination with hardening agents and crosslinkable acrylate resins per se or in combination with hardening agents,

(B) 55–90% by weight of at least one stabilized ethylene copolymer based on ethylene and vinyl compounds and

(C) 0–25% by weight of polyolefin, relative to the total amount of components (A) and (B), to a metallic substrate pre-heated to a temperature which is above the melting point of the resins (A) and which is adequate for their crosslinking, to form a first layer and applying, in a second state, a layer of an olefin polymer in the form of a tape or as a powder to the hot, coated substrate.

15. Metallic substrates in the form of pipes coated by the process as claimed in claim 1.

4,481,240

FLOOR MAT MOUNTING SYSTEM

David W. Roth, Grosse Pte. Park, Mich., assignor to The 2500 Corporation, Birmingham, Mich.

Continuation-in-part of Ser. No. 131,262, Mar. 17, 1980, Pat. No. 4,361,610. This application Nov. 29, 1982, Ser. No. 444,986
Int. Cl.[3] B32B *3/06*; B60J *9/00*
U.S. Cl. 428—95 21 Claims

1. A carpet protector adapted to be used on vehicle carpets, including, in combination, two pieces of carpet of a desired shape and cross section placed back-to-back and joined by a suitable edge binding applied around the periphery thereof, and a plurality of retaining devices affixed about the perimeter of the underside of said carpet protector, said retaining devices having thereon a plurality of stiff bristles having a spacing sufficient therebetween to allow the insertion of a floor carpet material in a frictional-mesh engagement.

4,481,241

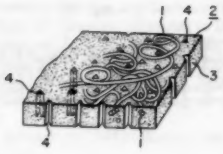
CORE MATERIAL FOR FIBER REINFORCED PLASTIC AND PROCESS FOR ITS PRODUCTION

Sadao Kawashima, Kanagawa, and Heiichi Takei, Ibaraki, both of Japan, assignors to Asahi Fiber Glass Company Limited, Tokyo, Japan

Filed Sep. 13, 1982, Ser. No. 417,574
Claims priority, application Japan, Oct. 30, 1981, 56-172939; May 14, 1982, 57-80117; May 14, 1982, 57-80118
Int. Cl.[3] B32B *3/10*
U.S. Cl. 428—134 26 Claims

1. A core material for a fiber reinforced plastic comprising a perforated glass fiber mat composed of glass fiber bundles and having a bulk density of from 50 to 150 kg/m^3 and a porous

material filled in void spaced in the glass fiber mat, said porous material being composed of a mixture of a thermoplastic resin and a filler wherein the thermoplastic resin is an unsaturated polyester resin containing no cross-linking agent.



4,481,242

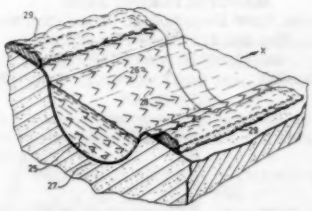
AQUATIC WEED BARRIER

Eldon L. Fletcher, Kingston, Canada, assignor to Du Pont Canada, Inc., Montreal, Canada

Filed Jul. 29, 1982, Ser. No. 402,859

Int. Cl.³ B32B *3/24*

U.S. Cl. 428—136 **4 Claims**



1. A film, of a thermoplastic synthetic polymer, having a plurality of vee-shaped incisions therein forming a triangular flap, the area of each such flap being between about 1 and 25 cm^2, there being between about 36 incisions and 1 incision per square meter of film, said film also having a light transmittance in the 200 to 650 nm wavelength range of less than 50%.

4,481,243

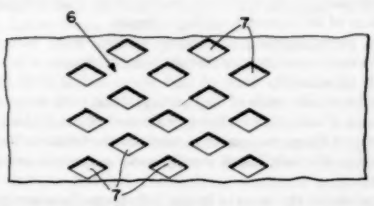
PATTERN TREATED TISSUE PAPER PRODUCT

Patrick J. Allen, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 5, 1984, Ser. No. 568,476

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—154 **5 Claims**



1. A personal care product comprising a planar substrate and an emollient carried by said substrate; said substrate comprising a laminate; said laminate comprising at least two plies of tissue paper in juxtaposed relation; said emollient being distributed over at least a major portion of at least one exposed surface of said substrate; said plies being united to form said laminate by a pattern of embossments in an embossing region; said embossing region being substantially free of emollient.

4,481,244

MATERIAL USED TO BEAR WRITING OR PRINTING

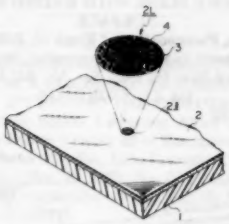
Masahiro Haruta, Funabashi; Takashi Hamamoto, Yokohama, and Shigeo Toganoh, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 459,987

Claims priority, application Japan, Mar. 3, 1982, 57-16159; Mar. 3, 1982, 57-16160; Mar. 3, 1982, 57-16161; Mar. 3, 1982, 57-16162; Mar. 3, 1982, 57-16163; Mar. 3, 1982, 57-16164; Mar. 3, 1982, 57-16165; Mar. 3, 1982, 57-16166

Int. Cl.³ G01D *15/34*; B32B *5/16, 5/22*

U.S. Cl. 428—155 **7 Claims**



1. A material used to bear writing or printing, which comprises a substrate of a recording paper suitable for ink jet recording and a coating layer formed thereon of a coating material containing a polymer having both hydrophilic segments and hydrophobic segments.

3. A material according to claim 1, wherein said substrate is constituted of a porous material.

4,481,245

METHOD OF ASSEMBLING BITUMINOUS SEALING ELEMENTS

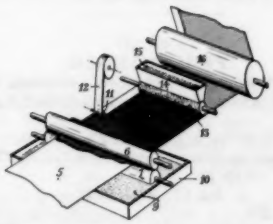
Jean-Yves Meynard, Mondoubleau, France, assignor to Siplast, S.A., Paris, France

Filed Oct. 22, 1982, Ser. No. 435,973

Claims priority, application France, Oct. 26, 1981, 81 20018

Int. Cl.³ B32B *23/02, 11/02*

U.S. Cl. 428—192 **9 Claims**



1. A sealing covering element constituted by a backing coated on both faces with bitumen and covered with a protection material, one edge of which is free of protection material and constitutes a jointing zone together with the opposed edge of the adjacent covering element, said opposed edge overlying said jointing zone so as to form, with an appropriate number of these elements of appropriate length, a sealing covering of the desired size, wherein said jointing zone is covered in the factory with a thin, porous and volatilizable web of non-woven fibers which is free of protection material whereby two adja-

cent elements by means of a solvent or a blowtorch can be joined together by positioning with overlap.

7. A process for manufacturing a sealing covering element comprising the following steps

(a) longitudinally conveying a backing between two superimposed transverse rotary rollers,

(b) spreading a bitumen coating onto both faces of said backing,

(c) applying onto one edge of the coated backing a strip of non-woven fibers by means of a small rotary transverse roller, and

(d) depositing powdered protecting material onto the whole backing by means of a transverse roller except for that portion containing said strip of non-woven fibers.

4,481,246

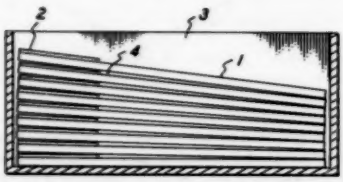
MICROSCOPE SLIDE WITH RAISED MARKING SURFACE

John M. Melisz, Portsmouth, and Frank H. Jellinek, Rye, both of N.H., assignors to Sybron Corporation, Rochester, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,448

Int. Cl.³ G02B *21/34*

U.S. Cl. 428—210 **1 Claim**



1. A microscope slide so configured with a raised portion at one end thereof that a plurality of such slides are stackable without extended area contact between them for substantially scratch-free packaging, said slide comprising:

a flat glass plate on which said raised portion is a marking surface formed of a coating of an epoxy resin on said glass plate,

said epoxy resin including a granular medium to impart porosity to said coating and a pigment to provide visual contrast to said coating to enhance visibility of marking to be placed thereon,

said raised marking surface being effective to provide a barrier to prevent the spread of liquid sample, placed upon said slide, onto said marking surface.

4,481,247

TEXTILE MATERIAL

Günter Tesch, Fribourg, and Siegfried Gieldanowski, Schmitten, both of Switzerland, assignors to Breveteam S.A., Fribourg, Switzerland

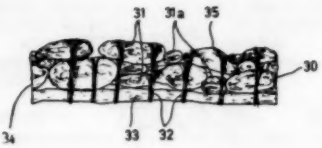
Filed Jan. 3, 1980, Ser. No. 109,302

Claims priority, application Switzerland, Jan. 9, 1979, 157/79; Nov. 14, 1979, 10152/79

Int. Cl.³ B32B *5/02*

U.S. Cl. 428—234 **34 Claims**

1. A textile material comprising a non-woven fibrous layer having an irregular surface formed by needle bonding a plurality of separate fiber aggregates, each aggregate having, prior to needle bonding, a substantially spherical to elongated shape with a smallest diameter of no less than 3 mm, said aggregate is formed from intertwined fibers which include fibers having a length of at least 15 mm, said aggregate also having a density ranging from about 0.01 to about 0.1 grams per cubic centimeter, the intertwining being such that a needle commonly used in needle processing technology to stitch material together may penetrate said aggregate and grip and withdraw a fiber from said aggregate free from encountering any substantial resistance by the aggregate so that the withdrawn length of fiber extends out of the aggregate without losing its cohesion



with the aggregate; and a multiplicity of needle processed connecting fibers interconnecting said fiber aggregates to form said non-woven fibrous layer.

4,481,248

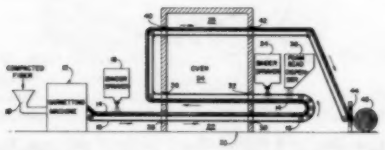
BUOYANT FIBER PRODUCT AND METHOD OF MANUFACTURING SAME

Richard Fraige, 11005 Hwy. 50 East, Carson City, Nev. 89701

Filed Jan. 5, 1982, Ser. No. 337,122

Int. Cl.³ B32B *5/16*; B05D *1/36*

U.S. Cl. 428—283 **30 Claims**



1. A method of manufacturing a buoyant, readily water-permeable and therefore heat-convection-transparent, but wave-retarding fiber product for use in waterbeds to deter wave action; said method comprising the following steps:

providing a quantity of lofted fibrous material comprising a large multiplicity of fibers, in the form of a matting that is readily water-permeable throughout;

while maintaining the lofted, readily water-permeable condition of the material, adding to said fibrous material a large multiplicity of particles, said particles being permanently buoyant at least upon or after application of heat and being spaced apart singly or in clusters to maintain the said readily water-permeable condition;

while maintaining the lofted, readily water-permeable condition of the material, adding a binder;

said particle-adding and binder-adding steps being performed in such a way that the binder contacts at least part of substantially each of said fibers and at least part of substantially each of said particles, and with substantially each of said particles being positioned adjacent at least one of said fibers, respectively, whereby the binder will set the material in said lofted, readily water-permeable condition; and

then leaving the material in said lofted, readily water-permeable condition for use in such waterbeds to float within and near the top thereof and to retard waves therein, the material being thereby effectively transparent to heat transfer through the water in such a waterbed by means of water convection currents.

2. A fiber product manufactured in accordance with the method of claim 1.

4,481,249

METALLIZED CARBON FIBRES AND COMPOSITE MATERIALS CONTAINING THESE FIBRES

Harold Ebneth, Leverkusen; Lothar Preis, Bergisch-Gladbach; Henning Giesecke, Cologne, and Gerhard D. Wolf, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 344,908, Feb. 2, 1982, abandoned. This application Jun. 24, 1983, Ser. No. 507,873

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106506

Int. Cl.³ B32B *9/00, 27/00;* B05D *3/00;* D04H *1/58*

U.S. Cl. 428—288 7 Claims

1. A composite material comprising a fiber reinforced matrix, said fiber being a nickel coated carbon fiber of graphite-like structure having an elastic modulus above 300,000 MPa, said matrix being an epoxide resin matrix, said nickel coated carbon fiber being bonded to said matrix, said carbon fibers having been metallized with said nickel by a current-less process employing an organo-metallic compound of an element of sub-group 1 or 8 of the periodic system as an activating agent and a liquid metallization bath.

4,481,250

VINYL ACETATE-ETHYLENE BINDER COMPOSITION HAVING GOOD WET TENSILE STRENGTH AND LOW HEAT SEAL TEMPERATURE FOR NONWOVEN PRODUCTS

Gerald R. Cook, Wyomissing, and Phillip A. Mango, Fogelsville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 29, 1983, Ser. No. 518,515

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—290 20 Claims

1. An emulsion composition providing a binder having good wet tensile strength and heat sealability for nonwoven products comprising an aqueous dispersion of a mixture consisting essentially of

(a) 50 to 95 wt% copolymer A containing 60 to 95 wt% vinyl acetate and 5 to 40 wt% ethylene, and

(b) 5 to 50 wt% copolymer B containing 60 to 95 wt% vinyl acetate, 5 to 40 wt% ethylene and up to about 10 wt% crosslinking mono-olefinically unsaturated monomer.

4,481,251

POLYARYLATE POLYMER COATINGS

Frederick Vratny, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 27, 1983, Ser. No. 489,042

Int. Cl.³ B32B *3/00, 5/16;* B05D *1/00*

U.S. Cl. 428—312.6 12 Claims

1. An article comprising

a substrate,

and a final adherent conformal coating over at least a portion of said substrate, in which said coating is prepared by a procedure that includes applying a solution comprising a solvent and solute that includes material which may be regarded as a polymer polymerized from monomer at least 90 percent by weight of which is a mixture of at least one diphenol and at least one dicarboxylic acid,

said article further comprising an adherent conformal layer intermediate said coating and the surface of said substrate, wherein said intermediate layer comprises a porous matrix.

4,481,252

SHEET MATERIAL

Stephen R. Postle, Brentwood, and James Doyle, Wickford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 19, 1982, Ser. No. 442,993

Claims priority, application United Kingdom, Dec. 10, 1981, 8137238

Int. Cl.³ B44D *5/00*

U.S. Cl. 428—323 8 Claims

1. A transparent sheet material, which comprises coated onto a transparent support, a transparent binder layer having dispersed therein colourless organic polymer beads of from 0.5 μm to 40 μm in size and which have substantially the same refractive index as the binder, the organic polymer beads comprising from 0.5 to 30% by weight of the binder and the binder being gelatin, modified gelatin or a mixture of gelatin and a polymer latex.

4,481,253

PROCESS FOR PREPARING FERROMAGNETIC METAL POWDER AND A MAGNETIC RECORDING MEDIUM INCLUDING THE POWDER

Akihiro Matsufuji; Shizuo Umemura; Akira Kasuga; Hajime Miyatuka, and Goro Akashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 10, 1982, Ser. No. 448,651

Claims priority, application Japan, Dec. 10, 1981, 56-199109; Dec. 10, 1981, 56-199110

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—323 16 Claims

1. A process for preparing a ferromagnetic metal powder, comprising the steps of:

heat-treating an acicular iron oxyhydroxide or an acicular iron oxide powder obtained from the acicular iron oxyhydroxide in a non-reducing gas at a temperature of from 300° C. to 1000° C. or in a reducing gas at a temperature of from 150° C. to 500° C.;

washing the resulting heat-treated acicular iron oxyhydroxide or acicular iron oxide powder; and

reducing the washed products under heating.

9. A magnetic recording medium, comprising:

a non-magnetic support base; and

a magnetic layer coated on a surface of the support base, the layer being comprised of a binder and a ferromagnetic metal powder prepared by the process of heat-treating an acicular iron oxyhydroxide or an acicular iron oxide powder obtained from the acicular iron oxyhydroxide in a non-reducing gas at a temperature of from 300° C. to 1000° C. or in reducing gas at a temperature of from 150° C. to 500° C., washing it and then reducing it under heating.

4,481,254

AGRICULTURAL PLASTIC FILM

Nobuo Fukushima, Ootsu; Kiyohiko Nakae, Nishinomiya, and Takayuki Terazawa, Shiga, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 148,230, May 9, 1980,. This application Jun. 24, 1982, Ser. No. 391,976

Claims priority, application Japan, May 15, 1979, 54-60025; May 15, 1979, 54-60024; May 15, 1979, 54-60026; Nov. 15, 1979, 54-148632

Int. Cl.³ B32B *9/04;* A01G *7/00*

U.S. Cl. 428—329 7 Claims

1. An agricultural plastic film laminate which comprises an olefin resin film produced by forming into a film a composition comprising 100 parts by weight of an olefin resin (A) and 2 to 25 parts by weight per 100 parts by weight of said olefin resin of an amorphous hydrated aluminum silicate gel represented by the formula:

$$(SiO_2)_x \cdot (Al_2O_3)_y \cdot nH_2O$$

wherein x and y are positive numbers such that $0.08 \leq y/x \leq 0.33$ and n is a positive number, said aluminum silicate containing not less than 10% of adsorbed water at 25° C. and at a relative humidity of 65%, the ratio of the refractive index (n_A) of said olefin resin to that (n_B) of said aluminum silicate gel, n_A/n_B, being within the range of 0.99 to 1.02,

wherein said olefin film is laminated with laminating resin selected from ionomer resins (C) and olefin resins (D) on one or both sides of the film.

4,481,255

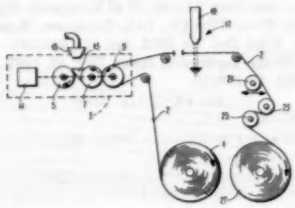
RADIATION HARDENED TRANSFER MEDIUM

Terence E. Franey, Lexington; Richard B. Watkins, Frankfort, and Austin W. Woolfolk, Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1982, Ser. No. 376,344

Int. Cl.[3] **B32B** *27/08, 5/18;* **C09J** *7/02;* **B41M** *5/10*

U.S. Cl. 428—355 **43 Claims**



1. A lift-off correctable transfer medium having a non-polar organic supporting substrate and a layer of marking material supported on said substrate, said marking material being transferable under pressure and being sufficiently cohesive when transferred as a printed character to be lifted-off by an adhesive element, said marking material comprising a polymerized acrylic acrylate as a primary bonding material.

4,481,256

WADDING MATERIALS

Yugoro Masuda, Takatsuki; Toyokazu Nonaka, Osaka, and Shigeru Kawase, Nara, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Continuation of Ser. No. 302,274, Sep. 15, 1981, abandoned. This application May 11, 1983, Ser. No. 492,547

Claims priority, application Japan, Sep. 18, 1980, 55-130274

Int. Cl.[3] **B32B** *5/16;* **D02G** *3/00;* **D04H** *1/04*

U.S. Cl. 428—362 **17 Claims**

1. A wadding material having high bulkiness, high compressibility, excellent recovery of bulkiness following compression, light weight and high warmth-retaining ability consisting essentially of a blend of (1) 80% to 20% by weight of staple fibers (A) having a monofilament fineness in the range of from 4 to 10 deniers and having a curliness of from not less than 15% up to about 30%; (2) 20% to 80% by weight of staple fibers (B) made of a synthetic polymer and having a monofilament fineness in the range of from 0.7 to 4 deniers and lower than the fineness of said staple fibers (A), said staple fibers (B) having a curliness of less than 15%, in which the curliness of said staple fibers (A) and (B) is equal to $(B-A)/B \times 100\%$, wherein A is the fiber length under a load of 2 mg/denier and B is the fiber length under a load of 50 mg/denier.

4,481,257

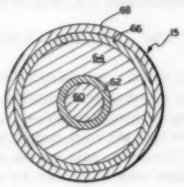
BORON COATED SILICON CARBIDE FILAMENTS

Raymond J. Suplinskas, Haverhill, and Albert W. Hauze, Chelmsford, both of Mass., assignors to Avco Corporation, Wilmington, Mass.

Continuation of Ser. No. 97,469, Nov. 26, 1979, abandoned. This application Jun. 17, 1983, Ser. No. 505,567

Int. Cl.[3] **D02G** *3/00*

U.S. Cl. 428—366 **10 Claims**



1. A high-strength high-modulus filament comprising:

a silicon carbide filament substrate having applied thereto a coating of boronic refractory material which has been deposited on said substrate heated to a temperature in the range of 1400° F. to 2550° F.

4,481,258

UV CURABLE COMPOSITION AND COIL COATINGS

Frank A. Sattler, Monroeville, Pa., and William S. Gorton, Jr., Athens, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1982, Ser. No. 433,324

Int. Cl.[3] **C08F** *2/50*

U.S. Cl. 428—371 **34 Claims**

1. A UV curable coating composition comprising

(A) about 20 to about 40% by weight of an acrylated epoxy which comprises the reaction product of about 2 equiv. of an epoxy resin having an E.E.W. of about 1500 to about 5000, and about 0.9 to about 1.1 equiv. of a compound selected from the group consisting of

(1) an anhydride acrylate adduct where said anhydride acrylate adduct has a functionality of 1 except in the case of trimellitic anhydride where said adduct has a functionality of 2 where said anhydride acrylate adduct comprises the reaction product of

(a) an acrylate selected from the group consisting of 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate, 2-hydroxyethyl methacrylate, and mixtures thereof; and

(b) 1 mole, ±10 mole %, per mole of said acrylate of an anhydride selected from the group consisting of phthalic anhydride, maleic anhydride, trimellitic anhydride, and mixtures thereof;

(2) an isocyanate which comprises the reaction product of

(a) 1 mole of an acrylate selected from the group consisting of 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate, 2-hydroxyethyl methacrylate, and mixtures thereof; and

(b) 1 mole of toluene diisocyanate, 4,4'-diisocyanato diphenyl methane, and mixtures thereof; and

(3) mixtures of (1) and (2)

(B) about 4 to about 15% by weight of an acrylated blocked isocyanate which comprises the reaction product of 1 mole caprolactam and 1 mole of an isocyanate adduct which comprises the reaction product of

(1) 1 mole of an acrylate selected from the group consisting of 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate and mixtures thereof; and

(2) about 0.99 to about 1.01 mole of a compound selected from the group consisting of toluene diisocyanate, 4,4'-diisocyanato diphenyl methane, and mixtures thereof;

(C) about 4.5 to about 65% by weight of a monoacrylate, of which at least 60% by weight is phenoxyethyl acrylate;

(D) about 5 to about 20% by weight of a polyacrylate, of which at least about 50% is tetraethylene glycol diacrylate;
(E) about 2 to about 5% by weight of a photo-initiator;
(F) about 0.05 to about 0.3% by weight inhibitor; and
(G) up to about 30% of a compound selected from the group consisting of acrylated hexamethoxymethylmelamine, acrylated urethane, and mixture thereof.

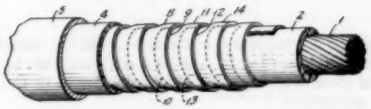
10. A method of forming a coating on a conductor comprising
(A) applying a composition according to claim **1** to said conductor;
(B) curing said composition by exposure to UV radiation;
(C) forming said conductor into a coil; and
(D) post curing said coil with heat.

4,481,259

ELECTRIC CABLE WITH INSULATION OF BIAXIALLY ORIENTED, POLYMERIC TAPE WITH A COATING OF GREASE

Bernardino Vecellio, Milan, Italy, assignor to Societa Cavi Pirelli S.p.A., Milan, Italy

Continuation of Ser. No. 347,646, Feb. 10, 1982, abandoned. This application Oct. 6, 1983, Ser. No. 539,627
Claims priority, application Italy, Feb. 18, 1981, 19819 A/81
Int. Cl.[3] **B32B** *15/00, 25/20;* **H01B** *9/02*
U.S. Cl. 428—377 **8 Claims**



1. A direct current, electric, power cable comprising a cable core comprising a conductor with insulation therearound and coaxial therewith and a sheath enclosing said insulation, said insulation comprising a plurality of layers of tape wound around the conductor with the turns of tape of one layer overlapping the turns of tape of the next adjacent layer, said insulation being impermeable to water in both the radial and longitudinal direction of the insulation and said tape being made of a biaxially oriented polymeric material having a coating on at least one surface thereof of a water-repellent, viscous grease which prevents infiltration of water between the turns and which does not adversely affect the properties of or swell the tape and said coating being present between the surfaces of overlapping turns of the tape to provide a water repellent film of said grease between adjacent turns of the tape which fills any spaces between the turns whereby any water which may penetrate into the interior of the sheath is prevented by the coating from infiltrating between the tape turns and migrating longitudinally of the insulation.

4,481,260

AROMATIC POLYSULFONE TYPE RESIN HOLLOW FIBER MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Takashi Nohmi, Fuji, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1983, Ser. No. 461,992
Claims priority, application Japan, Jan. 29, 1982, 57-12864
Int. Cl.[3] **D02G** *3/00*
U.S. Cl. 428—398 **2 Claims**

1. An aromatic polysulfone type resin hollow fiber membrane having a thickness of less than 100 μm and a three-layer structure of inner and outer surface skin layers and a void layer disposed therebetween and connected thereto; said void layer having a thickness of at least 5 μm and comprising at least 30 voids each having a length of 5 μm or more in a radial direction of a cross section of said hollow fiber membrane, said inner and outer skin layers each having a maximum pore diameter of 0.80 μm or less and a thickness of 0.1 to 10 μm, provided that the average value of thicknesses of said inner and outer surface skin layers is ½ or less the thickness of said void layer; said hollow fiber membrane having a cut-off molecular weight of less than 100,000.

4,481,261

BLISTER-RESISTANT DIELECTRIC

Gary W. Johnson, Stamford, Conn.; Ronald J. Schoonejongen, Carmel, N.Y., and David G. Hilson, II, Norwalk, Conn., assignors to Electro Materials Corp. of America, Mamaroneck, N.Y.

Filed Dec. 1, 1982, Ser. No. 445,687
Int. Cl.[3] **B32B** *17/06*
U.S. Cl. 428—434 **5 Claims**

1. A blister-resistant thick film dielectric usable with multilayer conductor configurations having one conductor layer comprising gold and another conductor layer comprising silver, said dielectric consisting essentially of, by weight and without vehicle, about 50% lead-boro-silicate glass, between about 25% to 40% Al_2O_3, and between about 10% to 25% of an oxide mixture consisting essentially of, by weight, about 36% to about 38% Co_2O_3, between about 24% to 28% Cr_2O_3 and between about 36% to 38% Fe_2O_3, said oxide mixture having been heated at about 1000° C. for about 24 hours.

5. The thick film dielectric of claim **1**, wherein said thick film dielectric is situated between a base conductor layer constituted of gold and a second conductor layer constituted of silver.

4,481,262

COMPOSITE STRUCTURES

Mitsuzo Shida, Barrington; Robert Zeitlin, Palatine; John Machonis, Jr., Schaumburg, and Ashok M. Adur, Rolling Meadows, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 350,265, Feb. 19, 1982, Pat. No. 4,452,942. This application Feb. 1, 1984, Ser. No. 576,023
Int. Cl.[3] **B32B** *27/32;* **C08L** *23/26, 23/04, 51/06*
U.S. Cl. 428—441 **55 Claims**

1. A composite structure comprising:
(a) a substrate, and adhered thereto
(b) an adhesive blend comprising:
(1) about 0.1–95 parts by weight in said blend of a graft copolymer of about 70–99.95 wt. % of an LLDPE backbone grafted with about 30–0.05 wt. % of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or carboxylic acid anhydride or about 50–99.90 wt. % of LLDPE backbone cografted with about 0.05–25 wt. % of said grafting monomer and about 0.05–25 wt. % of an unsaturated ester, said LLDPE backbone having a density of about 0.91–0.939 g/cc, for a total of 100% and
(2) about 99.9–5 parts by weight of a blending resin selected from the group consisting of homopolymers of

ethylene, α-olefin copolymers of ethylene, copolymers of ethylene and ethylenically unsaturated esters or their derivatives, and blends thereof.

21. A composite structure comprising:

(a) two or more substrates with adjacent pairs adhered together by

(b) an intervening layer of an adhesive blend comprising:

(1) about 0.1–95 parts by weight in said blend of a graft copolymer of about 70–99.95 wt. % of an LLDPE backbone grafted with about 30–0.05 wt. % of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or carboxylic acid anhydride or about 50–99.90 wt. % of LLDPE backbone cografted with about 0.05–25 wt. % of said grafting monomer and about 0.05–25 wt. % of an unsaturated ester, said LLDPE backbone having a density of about 0.91–0.939 g/cc, for a total of 100% and

(2) about 99.9–5 parts by weight of a blending resin selected from the group consisting of homopolymers of ethylene, α-olefin copolymers of ethylene, copolymers of ethylene and ethylenically unsturated esters or their derivatives, and blends thereof.

4,481,263

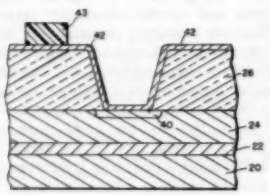
PROGRAMMABLE READ ONLY MEMORY

Kersi F. Cooper, San Jose, and Jerry W. Drake, Los Gatos, both of Calif., assignors to Raytheon Company, Lexington, Mo.

Division of Ser. No. 378,585, May 17, 1982, Pat. No. 4,420,504, which is a division of Ser. No. 219,124, Dec. 22, 1980, abandoned. This application Sep. 23, 1983, Ser. No. 535,122

Int. Cl.³ B05D *5/12*

U.S. Cl. 428—620 **3 Claims**



1. In combination:

(a) a layer of fusible material;

(b) a first layer of metal in contact with the fusible material;

(c) a plurality of layers of different insulating materials selected from the group consisting of silicon dioxide and silicon nitride and disposed over the first layer of metal and over a portion of the fusible material, such plurality of layers having a via formed therein exposing a portion of the first layer of metal;

(d) a second layer of metal disposed over the plurality of layers of insulating material, a portion of such second layer of metal extending through the via into the exposed portion of the first layer of metal.

4,481,264

METHOD FOR CHROMIZING METALLIC PIECES SUCH AS STEEL PIECES AND CHROMIZED METALLIC PIECES OBTAINED THEREBY

André Faure, Colombes, France, assignor to Societe Anonyme Dite: Aubert & Duval, Neuilly-sur-Seine, France

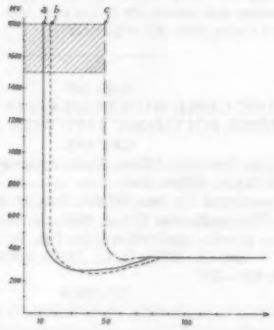
Continuation of Ser. No. 139,763, Apr. 14, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,433

Claims priority, application France, Apr. 20, 1979, 79 10094

Int. Cl.³ C23C *9/10, 9/16*

U.S. Cl. 428—627 **10 Claims**

1. A method for hard chromizing a steel piece to produce a chromized surface layer comprising chromium carbo-nitrides and having a hardness of at least 1200 VICKERS degrees and a depth of at least 12 microns, said method comprising a first step of introducing nitrogen into a surface layer of the steel piece to produce a nitrogenous surface layer having a nitrogen content greater than 0.8% over a depth of at least 0.5 mm by heating the steel piece for a period of time of 12 to 150 hours to a temperature which is both between 400° C. and 800° C. and lower than the lower critical point of the steel piece being treated, in a nitrogen producing medium; and a second step of diffusing chromium into said nitrogenous surface layer by the decomposition in a gaseous phase of chromium halides,



wherein the decomposition of the halides and the diffusion of the chromium into the steel is effected simultaneously by heating said piece to a temperature not exceeding 1300° C. in the halide atmosphere.

4. A hard-chromized steel piece comprising a steel piece having a hard chromized surface layer comprising chromium carbo-nitrides and having a hardness of at least 1200 Vickers degrees and a depth of at least 12 microns and an adjacent sub-layer having a hardness lower than that of the core of said piece, wherein the maximum variation of the hardness of said sub-layer is 25 Vickers degrees with respect to that of the core of said piece.

4,481,265

PHOTOVOLTAIC-STORAGE BATTERY DEVICE

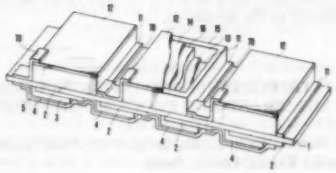
Masayoshi Ezawa; Akira Misumi; Kenkichi Suzuki, and Masaharu Kumada, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,086

Claims priority, application Japan, Jun. 11, 1982, 57-99231

Int. Cl.³ H01M *12/00*; H01L *31/04*

U.S. Cl. 429—9 **11 Claims**



1. A photovoltaic-storage battery device comprising:

an elongated thin metal strip substrate having a pair of major surfaces each with an insulating film formed thereon.

a plurality of photovoltaic elements formed on one insulated major surface of said substrate each photovolatic element including a first pair of spaced electrodes opposing each other and an amorphous silicon film intervening between each said first pair of opposing electrodes;

a plurality of storage battery elements formed on the other major insulated surface of said substrate, each storage battery element including a second pair of spaced opposing electrodes and an electrolyte intervening between each said second pair of opposing electrodes; and

electrical connections between said plurality of photovoltaic elements and said storage battery elements to form a multicell source of solar electric power with corresponding storage battery reserve power.

4,481,266

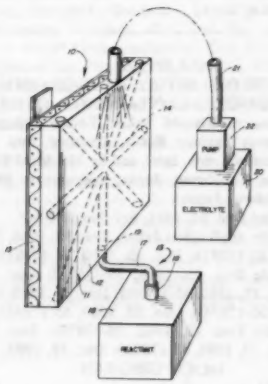
REACTIVE METAL BATTERY HAVING CONTINUOUS SUPPLY OF CATHODE REACTANT

Ernest L. Littauer, and William R. Momyer, both of c/o Lockheed Missiles & Space Company Inc., 1111 Lockheed Way, Sunnyvale, Calif. 94086

Filed Mar. 25, 1983, Ser. No. 478,695

Int. Cl.³ H01M 8/04

U.S. Cl. 429—12 **15 Claims**



1. A battery comprising a reactive metal electrode, flowed electrolyte, porous cathode structure defining a catalytically active surface at an interface with said electrolyte, and means for providing electrochemically reducible soluble cathode reactant material through the cathode to said active surface during operation of the battery in an amount sufficient to be reduced at said surface to maintain a high energy discharge rate.

4,481,267

INSOLUBLE HEAVY METAL POLYSULFIDE CATHODES

William L. Bowden, Nashua; Luverne H. Barnette, Derry, both of N.H., and David L. DeMuth, Waltham, Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Apr. 1, 1983, Ser. No. 481,181

Int. Cl.³ H01M 4/52, 6/16

U.S. Cl. 429—194 **18 Claims**

1. An electrochemical cell comprising an anode, an electrolyte and a solid active cathode comprised of one or more heavy metal polysulfides with each having the formula $M_x^m(S_y)_z^{-2}$ wherein M is a heavy metal, S is sulfur, $mx=2z$ and y is greater than 2.

4,481,268

METHOD OF FORMING A PHOTOGRAPHIC DYE IMAGE

Joseph Bailey, Bushey Heath; David Clarke; Michael W. Crawley, both of Watford; Peter D. Marsden, North Harrow, and Jasbir Sidhu, Harrow, all of England, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/GB82/00263, § 371 Date Apr. 29, 1983, § 102(e) Date Apr. 29, 1983, PCT Pub. No. WO83/00939, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 2, 1982, Ser. No. 499,754

Claims priority, application United Kingdom, Feb. 9, 1981, 8126620

Int. Cl.³ G03C 7/40

U.S. Cl. 430—17 **18 Claims**

1. A method of forming a photographic azo or azomethine dye image in an exposed photographic silver halide element, the method comprising the steps of

(a) developing the imagewise exposed material to form an imagewise pattern of oxidized color developing agent, then

(b) reacting the oxidized color developing agent with a color coupler to produce an image dye,

wherein both the color developing agent and the color coupler possess at least one metal chelating site such that the image dye is capable of forming a tri- or higher-dentate metallized dye, and

(c) contacting the image dye with polyvalent metal ions to form a metallized image dye.

13. A method as in claim 1 wherein the photographic silver halide element is a multilayer color element comprising image-forming units sensitive to blue, green and red light, respectively, and capable of forming yellow, magenta and cyan dye images respectively.

4,481,269

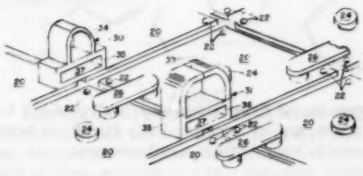
BATTERY CELL COVERS WITH SNAP-ON CABLE RETAINERS

James H. Barrett, Jr., 5055 Gold Creed Rd., Sylvania, Ohio 43560

Filed May 23, 1983, Ser. No. 497,603

Int. Cl.³ H01M 2/10

U.S. Cl. 429—121 **5 Claims**



1. In a battery having a plurality of cells with rectangular covers, a removable flexible plastic cable retainer comprising: a lower supporting portion and an upper loop portion for retaining an electric conductor cable extending above said covers, the improvement in said covers and said retainers comprising:

(A) identical snap friction-fitting means equally and symmetrically located adjacent each corner of each battery cell cover, and

(B) an identical pair of fitting means on the underside of opposite ends of the lower portion of each cable retainer, cooperating by snap fitting with an adjacent pair of said snap friction-fitting means on adjacent corners of two adjacent cell covers.

4,481,270

PHOTORECEPTOR CONTAINING SQUARIC ACID METHINE DYES

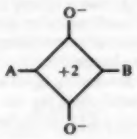
Tomio Kubota, San Jose, and Herbert K. Wurster, Los Gatos, both of Calif., assignors to Ricoh Systems, Inc., San Jose, Calif.

Filed Apr. 28, 1983, Ser. No. 489,405
Int. Cl.³ G03C 5/06
U.S. Cl. 430—55 **11 Claims**

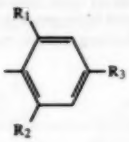
1. A photoreceptor for use in an electrophotographic imaging process having a double charging sequence, comprising:

(a) a substrate;

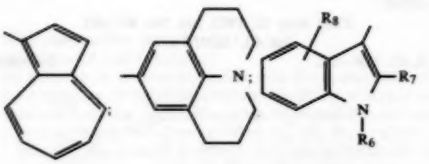
(b) a photosensitive layer consisting essentially of a non-charge-transporting binder material and a charge-generating, charge-transporting squaric acid methine dye selected from the group consisting of compounds of formula I:



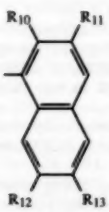
wherein A and B are independently,



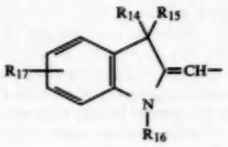
wherein R_1, R_2, and R_3 are independently H, OH, alkyl of 1 to 6 carbon atoms, or NR_4R_5, wherein R_4 and R_5 are independently alkyl of 1 to 6 carbon atoms;



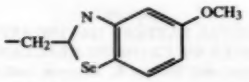
wherein R_6 and R_7 are independently alkyl of 1 to 6 carbon atoms, and R_8 is independently H, OR_9 or halogen, wherein R_9 is alkyl of 1 to 6 carbon atoms;



wherein R_{10}, R_{11}, R_{12} and R_{13} are independently H, OH or alkyl of 1 to 6 carbon atoms;



wherein R_{14}, R_{15}, and R_{16} are independently alkyl of 1 to 6 carbon atoms, and R_{17} is independently H, OR_{18}, or halogen, wherein R_{18} is alkyl of 1 to 6 carbon atoms; or



wherein said binder material is capable of supporting and storing charge throughout said photosensitive layer and wherein the ratio of said dye to said binder material is in the range from about 1:1 to about 1:40; and

(c) an insulating layer.

4,481,271

LAYERED ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR CONTAINING A HYDRAZONE

Mitsuru Hashimoto; Kiyoshi Sakai; Toshio Fukagai, all of Numazu, Japan; Tatsuya Katoh, deceased, late of Tokyo, Japan (by Tazuko Katoh, heir), and by Mankichi Katoh, legal representative, Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,548

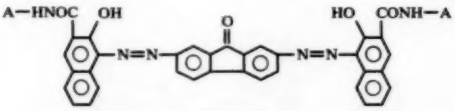
Claims priority, application Japan, Dec. 15, 1980, 55-176913; Dec. 15, 1980, 55-176914; Dec. 15, 1980, 55-176915; Dec. 15, 1980, 55-176916; Dec. 15, 1980, 55-176917; Dec. 15, 1980, 55-176918; Dec. 15, 1980, 55-176919; Dec. 15, 1980, 55-176920; Dec. 19, 1980, 55-178748; Dec. 19, 1980, 55-178749; Dec. 19, 1980, 55-178750; Dec. 19, 1980, 55-178751; Dec. 19, 1980, 55-178752; Dec. 19, 1980, 55-178760; Dec. 19, 1980, 55-178761

Int. Cl.³ G03G 5/06

U.S. Cl. 430—57 **16 Claims**

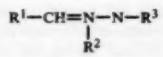
1. In a layered electrophotographic photoconductor comprising an electroconductive support material and a a photoconductive double layer which consists of a charge generation layer and a charge transport alyer, the improvement wherein:

a. said charge generation layer comprises a charge generating material selected from the group consisting of bisazo pigments of the formula



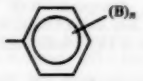
wherein A represents $-C_6H_4-Cl(o)$, $-C_6H_4-Cl(m)$, $-C_6H_4-Br(o)$, $-C_6H_4-Br(m)$, $-C_6H_4-F(o)$, $-C_6H_4-F(m)$, $-C_6H_4-F(p)$, or $-C_6H_4-I(m)$; and

b. said charge transport layer comprises a charge transporting material selected from the group consisting of the hydrazone compounds of the formula



wherein R^1 represents a substituted or non-substituted

naphthyl group, a substituted or non-substituted anthryl group, a substituted or non-substituted styryl group, or



wherein B represents hydrogen, an alkyl group with one to three carbon atoms, an alkoxy group with one to three carbon atoms, a dialkylamino group, halogen, a nitro group, or a hydroxy group, and n represents an integer of 1 to 5, and when n is 2 or more, B can be different or identical to each other; R^2 represents an alkyl group, a benzyl group; and R^3 represents a phenyl group or a methoxyphenyl group.

4,481,272

LAYERED ELECTROPHOTOGRAPHIC RECORDING MEDIUM COMPRISING HETEROCYCLIC NITROGEN CONTAINING ORGANIC DYE COMPOUNDS

Albrecht Eckell; Heinz Eilingsfeld, both of Frankenthal; Albert Elzer, Otterstadt; Franz Feichtmayr, Ludwigshafen; Gerhard Hoffmann, Otterstadt; Reinhold J. Leyrer, Ludwigshafen, and Peter Neumann, Wiesloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

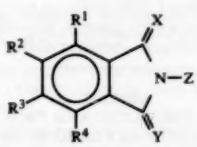
Continuation of Ser. No. 358,591, Mar. 16, 1982, abandoned. This application Nov. 22, 1983, Ser. No. 554,435

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110953

Int. Cl.³ G03G 5/06, 5/14

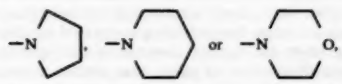
U.S. Cl. 430—58 **16 Claims**

1. An electrophotographic recording medium which consists essentially of an electrically conductive base, a first layer containing charge carrier-producing dyes, and a second layer which is substantially transparent to actinic light and is composed of an insulating organic material containing at least one compound which is charge carrier-transporting when exposed to light, wherein the charge carrier-producing dye is of the formula I



(I)

where R^1, R^2, R^3 and R^4 are each hydrogen, halogen, methyl or phenylthio, and one or two of the radicals R^1, R^2, R^3 and R^4 are C_2–C_6-alkyl, cyclohexyl, phenyl, naphth-2-yl, hydroxyl; C_1–C_6-alkoxy, allyloxy, phenoxy, methylthio, benzylthio, C_1–C_4-alkylsulfonyl, phenoxysulfonyl, trimethylsilyl, trifluoromethyl, cyano, nitro, amino, N,N-C_1–C_4-dialkylamino, a radical of the formula



a radical of the formula NH.CO.R^5, where R^5 is C_1–C_6-alkyl, or unsubstituted or substituted aryl, or are C_1–C_4-alkylcarbonyl, phenylcarbonyl or C_1–C_4-alkoxycarbonyl, and the remaining radicals are each hydrogen, X and Y may be identical or different and each is the radical of a methylene-active compound (>C=) or a radical of the formula =N—R^6, where R^6 is the radical of an aliphatic, cycloaliphatic, araliphatic, aromatic or heterocyclic amine or hydrazine, and Z is hydrogen, methyl or phenyl.

4,481,273

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND PREPARATION THEREOF

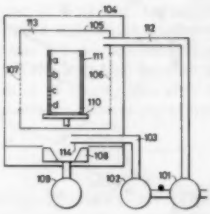
Kazuharu Katagiri; Yoshihiro Oguchi, both of Yokohama, and Yoshio Takasu, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,430

Claims priority, application Japan, May 27, 1982, 57-90268

Int. Cl.³ G03G 5/04

U.S. Cl. 430—59 **33 Claims**



1. An electrophotographic photosensitive member comprising a photosensitive layer formed by coating a coating solution containing a photoconductive compound on an electroconductive substrate of a metal or metal alloy followed by drying, said electroconductive substrate having a C/ρ value of 0.250 or less when the heat capacity per unit surface area of said electroconductive substrate is made C cal/cm².°C. and the thermal conductivity of the material for said electroconductive substrate is made ρ cal/cm.sec.°C.

6. An electrophotographic photosensitive member according to claim 1, wherein said photosensitive layer comprises a charge generating layer and a charge transport layer.

18. An electrophotographic photosensitive member according to claim 6, wherein said charge transport layer is a coated film having at least one kind of photoconductive compound selected from the group consisting of pyrazolines, hydrazones, diphenylmethanes, triphenylmethanes, triphenylamines, oxadiazoles, benzooxazoles, oxazoles, thiazoles, styryls and photoconductive polymers.

4,481,274

DEVELOPING POWDER HAVING OINYLIC, CROSSLINKED BINDER AND OLEFIN POLYMER

Yasuo Mitsuhashi, Yokohama, and Masaki Uchiyama, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 319,083

Claims priority, application Japan, Nov. 11, 1980, 55-158511

Int. Cl.³ G03G 9/08

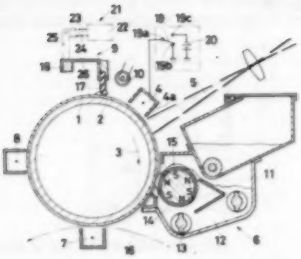
U.S. Cl. 430—109 **9 Claims**

1. A developing powder which comprises a binder containing 0.1–5% by weight of an olefin homopolymer or copolymer having a melt viscosity at 140° C. of 10–10^6 cps and containing 50% by weight or more of a crosslinked polymer, said crosslinked polymer in its entirety having a gel content of 10% or less and being prepared from a vinyl type monomer and a crosslinking agent monomer contained in an amount of 0.01–10% by weight based on the total weight of the monomer.

4,481,275
METHOD OF PREVENTING TONER FROM SCATTERING IN AN ELECTROSTATIC COPYING MACHINE

Masahide Iseki, Osaka; Tadanobu Nakajima, Nara; Hiroshi Kajita, Hyogo, and Masuo Kawamoto, Osaka, all of Japan, assignors to Mita Industrial Company Ltd., Osaka, Japan

Filed Jan. 19, 1983, Ser. No. 459,247
Claims priority, application Japan, Jan. 30, 1982, 57-14037
Int. Cl.³ G03G 13/22
U.S. Cl. 430—125 3 Claims



1. A method of preventing the scattering of residual charged toner from a movable photosensitive member of an electrostatic copying of the type also including a corona discharger for charging said photosensitive member, means for forming on the thus charged photosensitive member an electrostatic latent image of an original to be copied, a development unit disposed downstream of said corona discharger with respect to the direction of movement of said photosensitive member and having a development roller for applying toner, charged at a polarity opposite to that of said photosensitive member, to said photosensitive member and thereby to develop said electrostatic latent image into a toner image, means for transferring said toner image to a recording sheet, and a blade member positioned downstream of said transferring means and upstream of said corona discharger, said method comprising:

maintaining said blade member in sliding contact with said photosensitive member during a first mode of operation of said copying machine in which an image is formed on said photosensitive member and transferred therefrom to a recording sheet, thereby blocking from movement with said photosensitive member residual charged toner not transferred to the recording sheet, and thus maintaining a mass of the thus blocked toner at a position on the upstream side of said blade member;

removing said blade member from contact with said photosensitive member during a second mode of operation of said copying machine in which no image is formed on said photosensitive member, and thereby allowing said mass of toner to move with said photosensitive member toward said development roller; and

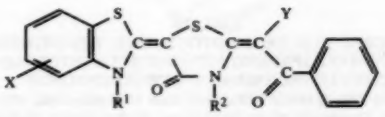
during said second mode of operation applying to a member of said copying machine, other than said photosensitive member and positioned between said blade member and said development roller, a bias potential of the same polarity as that of said toner, and thereby repelling said mass of toner toward said photosensitive member.

4,481,276
PHOTOPOLYMERIZABLE COMPOSITION CONTAINING A COMBINATION OF PHOTOINITIATORS

Shun-ichi Ishikawa, Shizuoka; Koji Tamoto, Kanagawa; Masayuki Iwasaki, and Akira Umehara, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

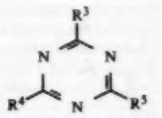
Filed Nov. 14, 1983, Ser. No. 551,616
Claims priority, application Japan, Nov. 12, 1982, 57-198363
Int. Cl.³ G03C 1/68
U.S. Cl. 430—281 14 Claims

1. A photopolymerizable composition comprising a polymerizable compound having an ethylenically unsaturated bond and a photopolymerization initiator, wherein said photopolymerization initiator comprises a compound represented by general formula I



I

wherein R^1 and R^2 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, or an aralkyl group; X represents a substituent having a Hammett's value of not more than 0.7; and Y represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, an acyl group, or an alkoxycarbonyl group and a 1,3,5-triazine compound represented by general formula II



II

wherein R^3, R^4, and R^5 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, or an aralkyl group; at least one of them being a mono-, di-, or tri-halogen-substituted methyl group.

4,481,277
PHOTOGRAPHIC PRODUCTS AND PROCESSES WITH SCAVENGERS FOR SILVER IONS OR SILVER COMPLEXES

William J. Pfingston, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 2, 1983, Ser. No. 463,075
Int. Cl.³ G03C 5/54, 1/40, 1/10
U.S. Cl. 430—218 30 Claims

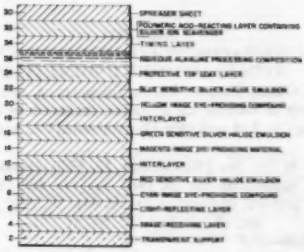
1. In a photographic product for providing a multicolor image comprising a plurality of layers which are maintained intact subsequent to image formation including a support, at least two selectively sensitive silver halide emulsion layers on said support, each of said emulsion layers having associated therewith an image dye-providing compound capable of undergoing silver ion assisted cleavage in the presence of an imagewise distribution of silver ions and/or soluble silver complex to provide a color-providing moiety in an imagewise distribution corresponding to said distribution of silver ions and/or soluble silver complex to form a dye image:

the improvement which comprises including a silver halide developing agent in one of the afore said layers or in a separate layer, said developing agent being so positioned and/or so constituted that it is made available to reduce said silver ions and/or soluble silver complex at a prede-

termined time after but not prior to substantially complete formation of said dye image.

2. A photographic product as defined in claim 1 which includes an acid-reacting layer.

3. A photographic product as defined in claim 2 wherein said selectively sensitive emulsion layers are a red-sensitive emulsion, a green-sensitive emulsion and a blue-sensitive emulsion, and said image dye-providing compounds associated with said silver halide emulsions are, respectively, a cyan image dye-providing compound, a magenta image dye-providing compound and a yellow image dye-providing compound.



4. A photographic product as defined in claim 3 wherein each said image dye-providing compounds is substantially non-diffusible and undergoes cleavage to release a diffusible color-providing moiety.

5. A photographic product as defined in claim 4 wherein said diffusible color-providing moiety is a diffusible dye and said photographic product includes a superposed image-receiving layer so positioned as to be capable of receiving by diffusion transfer an imagewise distribution of each said diffusible dye.

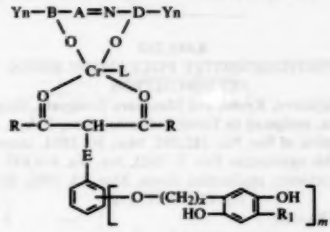
4,481,278

CHROME COMPLEXED DYE DEVELOPER COMPOUNDS AND PHOTOGRAPHIC PRODUCTS AND PROCESSES

Patrick F. King, Needham, and Stephen G. Stroud, Brighton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 29, 1982, Ser. No. 437,617
Int. Cl.³ G03C 1/40, 5/54, 7/00; C09B 45/00
U.S. Cl. 430—225 **24 Claims**

13. A diffusion transfer photographic film unit comprising a first support and a second support, at least one of said supports being transparent; a plurality of layers carried on one of said supports including a red sensitive silver halide emulsion layer associated with a cyan dye developer layer, a green sensitive silver halide emulsion layer associated with a magenta dye developer layer and a blue sensitive silver halide emulsion layer associated with a yellow dye developer layer; an image receiving layer carried on one of said supports; a rupturable container releasably holding a processing composition adapted, when distributed between a pair of predetermined layers carried by said supports, to develop said silver halide emulsion layers and provide a diffusion transfer image in said image receiving layer; means providing a white light-reflecting layer between said image receiving layer and said silver halide emulsion layers after development thereof and to provide a white background for a diffusion transfer image formed in said image receiving layer, said diffusion transfer image being viewable through said transparent support; said supports and layers carried thereon being held in fixed relationship with said silver halide emulsion layers being photoexposable through a transparent support, said yellow dye developer layer comprising a compound represented by the formula



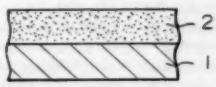
wherein A is —CH— or —N—; B is a radical of benzene or naphthalene; D is a radical of benzene, naphthalene, pyrazolene or pyrimidine; E is alkylene having from 1 to 6 carbon atoms; L represents a molecule that satisfies the coordination sphere of chromium; R is selected from the group consisting of H, alkyl, alkoxyalkyl, alkylamino and aryl; R_1 is selected from the group consisting of H, alkyl and aryl; Y is a silver halide developing substituent; x is an integer of from 1 to 6; m is 1 or 2; and n is 0 or 1.

4,481,279

DRY-DEVELOPING RESIST COMPOSITION

Jiro Naito, Kanagawa; Yasuhiro Yoneda, Machida, and Kenroh Kitamura, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 7, 1982, Ser. No. 385,886
Claims priority, application Japan, Jun. 9, 1981, 56-87565
Int. Cl.³ G03C 1/72; G03F 7/26
U.S. Cl. 430—280 **13 Claims**



1. A dry-developing positive resist composition consisting of (a) a polymeric material containing, in the molecular sructure, (i) unsaturated hydrocarbon bonds including at least one of vinyl, allyl, cinnamoyl, or acryl double bonds, (ii) epoxy groups or (iii) halogen atoms, and (b) 1% to 70% by weight, based on the weight of the composition, of a silicon compound, wherein the silicon compound is selected from the group consisting of bis(p-biphenyl)diphenylsilane, bis(phenylamino)-dimethysilane, t-butyldimethylchlorosilane, t-butyldiphenyl-chlorosilane, dibenzyldimethylsilane, dicyanodimethylsilane, diphenylsilanediol, tetraacetoxysilane, tetraphenoxysilane, tetraphenoxysilane, tetraphenysilane, tribenzylchlorosilane, triphenylchorosilane, triphenylethylsilane, triphenylfluorosilane, triphenylsilane, triphenylsilanol, triphenylsilylazido, triphenylvinylsilane, 1,2-dimethyl-1,1,2,2-tetraphenyldisilane, 1,1,1-trimethyl-2,2,2-triphenyldisilane, 1,3-dimethyl-1,1,3,3-tetraphenyldisiloxane, 1,3,-divinyl-1,1,3,3-tetraphenyldisiloxane, 1,3-ethoxy-1,1,3,3-teraphenyldisiloxane, 1,1,5,5-tetraphenyl-1,3,3,5-tetramethyltrisiloxane and 1,4-bis(hydroxydimethylsilyl)benzene.

2. A process for forming a positive resist pattern on a substrate, comprising

coating the substrate to form a resist layer, said resist layer comprising (a) a polymeric material containing, in the molecular structure, (i) unsaturated hydrocarbon bonds including vinyl, allyl, cinnamoyl, or acryl double bonds, (ii) epoxy groups or (iii) halogen atoms, and (b) 1% to 70% by weight, based on the weight of the composition, of a silicon compound,

selectively exposing the resist layer to radiation, and

developing a positive resist pattern on the substrate by treat-

ment with gas plasma to remove the part of said resist layer exposed to said radiation.

4,481,280

PHOTOSENSITIVE POLYAMIDE RESIN COMPOSITION

Junichi Fujikawa, Kyoto, and Masaharu Taniguchi, Shiga, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 242,307, Mar. 10, 1981, abandoned. This application Feb. 7, 1983, Ser. No. 464,652

Claims priority, application Japan, Mar. 13, 1980, 55/32044

Int. Cl.³ G03C *1/68*

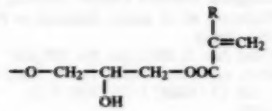
U.S. Cl. 430—281 **9 Claims**

1. A photosensitive polyamide resin composition comprising the following components:

(A) 100 parts by weight of an alcohol-soluble polyamide,

(B) 0.1 to 50 parts by weight of a compound having both vinyl and epoxy groups in the same molecule,

(C) 10 to 200 parts by weight of a polyfunctional vinyl monomer having a molecular weight of lower than 2,000 which is prepared by the reaction of a polyfunctional glycidyl ether with acrylic acid or methacrylic acid, or by the reaction of a saturated polyhydric alcohol with glycidyl acrylate or glycidyl methacrylate, at least two unsaturated bonds in the polyfunctional vinyl monomer being represented by the formula:



wherein R stands for H or CH_3, and

(D) 5 to 100 parts by weight of a monofunctional vinyl monomer selected from the group consisting of β-hydroxyethyl-β-acryloyloxyethyl phthalate, β-hydroxethyl-β-methacryloyloxyethyl phthalate, 2-hydroxy-3-phenoxypropyl acrylate and 2-hydroxy-3-phenoxypropyl methacrylate.

4,481,281

POLYMER COMPOSITION HAVING TERMINAL ALKENE AND TERMINAL CARBOXYL GROUPS

Jung-Hsien Tsao, Marietta, and Paul R. Hein, Atlanta, both of Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 225,809, Jan. 16, 1981, Pat. No. 4,422,914. This application Sep. 29, 1982, Ser. No. 426,411

Int. Cl.³ C07C *125/073*; G03C *1/70*

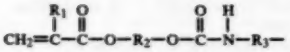
U.S. Cl. 430—284 **9 Claims**

1. A liquid polymer composition suitable for use as a photo resist comprising:

(a) liquid polymer wherein the polymer consists eventually of a polymer having a single terminal alkene unsaturation at one end, a terminal carboxyl group at the other end, said carboxyl group and alkene unsaturation being in a ratio of about 1 to 1 a molecular weight of about 250 to 10,000, and an acid content of about 0.1 to 4.0 mille-equivalents/gram; and

(b) an additive to control the viscosity of said liquid polymer and to enhance the alkaline stripability of the cured liquid polymer.

2. A liquid polymer composition suitable for use as a photo resist as in claim 1 wherein said polymer has the structure:



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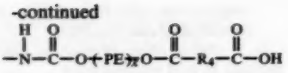


wherein R_1 is hydrogen, methyl or ethyl, R_2 is alkyl of from 1 to 6 carbon atoms, R_3 is alkyl, aryl or alkylaryl, (PE) is selected from the group consisting of polyethers, polyesters and mixtures thereof, x is an integer of from 2 to 50 and R_4 is alkyl, alkene, aryl or alicyclic.

4. A liquid polymer composition as in claim 2 suitable for use as a photo resist which includes a photoinitiator for promoting free radical generation.

4,481,282

DRY PLANOGRAPHIC PLATES FOR DIRECT PRINTING WITH ELASTOMER UNDERLAYER

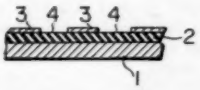
Hiroyuki Obata, Tokyo; Minoru Takamizawa, and Yoshio Inoue, both of Gunma, all of Japan, assignors to Dai Nippon Printing Co., Ltd. and Shin-Etsu Chemical Co., both of Tokyo, Japan

Division of Ser. No. 190,038, Sep. 23, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,335

Claims priority, application Japan, Sep. 28, 1979, 54-125131

Int. Cl.³ G03F *7/10*; B41M *1/00*

U.S. Cl. 430—303 **1 Claim**



1. A method for the preparation of a printing plate for dry-process direct planographic printing which comprises the steps of

(a) coating a substrate plate made of a metal and provided on the surface with a layer made of a rubbery elastomer having an oleophilic surface with a photocurable organopolysiloxane all over the surface thereof to form a photosensitive layer;

(b) exposing the photosensitive layer pattern-wise to light through a positive transparency in direct contact with the substrate surface in such a dose that the photocurable organopolysiloxane on the exposed areas is cured to form the non-image areas of the printing plate; and

(c) removing the uncured organopolysiloxane on the unexposed areas by development so as to expose the oleophilic surface of the substrate bare to form the image areas of the printing plate.

4,481,283

METHOD OF MANUFACTURING AN INTEGRATED CAPACITOR AND DEVICE OBTAINED BY THIS METHOD

George Kerr, St Sebastien sur Loire, and Yves Méheust, Caen, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,426

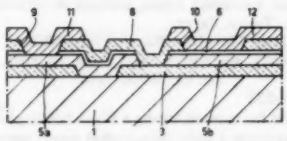
Claims priority, application France, Apr. 30, 1982, 82 07535

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—319 **4 Claims**

1. A method of manufacturing a semiconductor device having a semiconductor body which at a surface is provided with circuit elements and a multilayer wiring structure, in which the surface of the semiconductor body is coated with a first layer of insulating material on which there is formed from a metal layer deposited on the insulating material a first conductor pattern which contacts the semiconductor body at the area of contact holes in the first layer of insulating material and com-

prises at least one plate of a capacitor, after which a second conductor pattern is applied which comprises a second plate of the capacitor and is separated therefrom by a dielectric obtained by anodic oxidation from the metal layer deposited on the first layer of insulating material, characterized in that, after the first layer of insulating material has been provided with contact windows, the metal layer is deposited on the whole surface of the semiconductor body and is converted over a pair of its thickness by anodic oxidation into a second insulating layer of metal oxide, after which the double layer of metal and metal oxide is patterned photolithographically and the assembly is then coated with a third layer of insulating material, which at the area of the second plate of the capacitor and of connections between the two conductor patterns is provided with apertures, the metal oxide formed further being removed at the area of the connections, after which a layer of conductive material is applied, from which the second conductor pattern is formed photolithographically, which at the area of the connections contacts the first conductor pattern and which comprises the second plate of the capacitor, which is separated from the first plate by a part of the layer of metal oxide which is grown by anodic oxidation and serves as a dielectric.



4,481,284

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masashi Ogawa; Kunio Ishigaki; Nobuyuki Iwasaki, and Taku Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1982, Ser. No. 420,687

Claims priority, application Japan, Sep. 21, 1981, 56/149081

Int. Cl.³ G03C *5/16, 1/76, 1/30*

U.S. Cl. 430—355 **37 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon a light-sensitive silver halide emulsion layer and a light-insensitive uppermost layer, wherein the light-insensitive uppermost layer has a melting time longer than that of the light-sensitive silver halide emulsion layer and a thickness of the light-insensitive uppermost layer is from 0.3 μm to 0.8 μm, wherein the light-insensitive uppermost layer is hardened with a diffusion-resistant polymeric hardening agent.

4,481,285

METHOD OF TREATING DIRECT POSITIVE SILVER HALIDE SENSITIVE MATERIAL

Yoshihiro Takagi; Shigeo Hirano, and Tadao Sugimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 14, 1983, Ser. No. 484,811

Claims priority, application Japan, Apr. 14, 1982, 57-61935

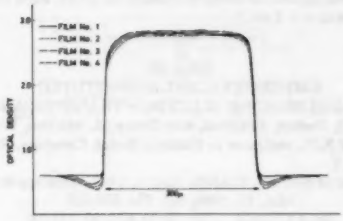
Int. Cl.³ G03C *5/24*

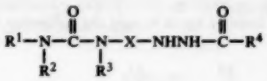
U.S. Cl. 430—410 **17 Claims**

1. A method of treating a photographic material for forming a direct positive image, comprising the steps of:

providing a direct positive silver halide sensitive material which has been imagewise exposed to light and comprising a base having thereon a fogging compound represented by the general formula (I), an inner latent image type sensitive silver halide photographic emulsion layer which is not previously fogged, and a hydrophilic colloid layer; and

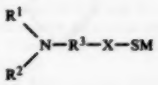
developing the material in the presence of a compound represented by the general formula (II):





(I)

wherein R^1 and R^2 independently represent a hydrogen atom, an aliphatic residue, an aromatic residue or a heterocyclic residue, R^3 represents a hydrogen atom or an aliphatic residue, R^4 represents a hydrogen atom, an aliphatic residue or an aromatic residue, and X represents a divalent aromatic residue;



(II)

wherein R^1 and R^2 represent each a hydrogen atom or an aliphatic residue, and R^1 and R^2 may form a ring by linking together, R^3 represents a divalent aliphatic residue, X represents a single bond or a divalent heterocyclic ring containing one or more nitrogen, oxygen or sulfur atoms, and M represents a hydrogen atom, an alkali metal, an alkaline earth metal, a quaternary ammonium group, a quaternary phosphonium group or an amidino group said compound represented by formula (II) is present in an amount sufficient to improve the sharpness and edge effect of said direct-positive image.

4,481,286

LIGANDS AND PHOTOGRAPHIC PROCESS

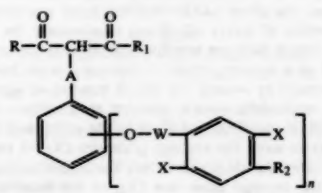
Patrick F. King, Needham, and Stephen G. Stroud, Brighton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 29, 1982, Ser. No. 437,611

Int. Cl.³ G03C *5/54, 1/42*

U.S. Cl. 430—441 **5 Claims**

1. A photographic method which comprises treating an exposed silver halide emulsion with an aqueous alkaline processing composition containing a silver halide developing agent which is represented by the formula



wherein W is alkylene having from 1 to 6 carbon atoms, R and

R_1 are the same or different and are selected from the group consisting of H, alkyl, alkoxyalkyl, alkylamino and aryl; A is alkylene having from 1 to 6 carbon atoms; X is —OH or a substituent capable of being converted to —OH; R_2 is H, alkyl or aryl; and n is 1 or 2.

4,481,287

4-HYDROXYALKYL-SUBSTITUTED 3-PYRAZOLIDINONE ELECTRON TRANSFER AGENTS

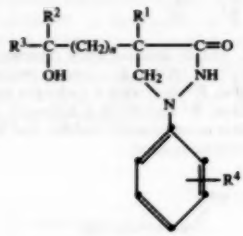
George B. Bodem, Pittsford, and Drake M. Michno, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 520,086, Aug. 4, 1983,. This application Mar. 19, 1984, Ser. No. 590,810

Int. Cl.³ G03C 5/30; C07D 403/00, 231/00

U.S. Cl. 430—483 **9 Claims**

1. An alkaline processing composition comprising a silver halide electron transfer agent having the following formula:



wherein:

n is 1 or 2;

R^1 represents an alkyl group of 1 to about 6 carbon atoms, an aryl or substituted aryl group of 6 to about 10 carbon atoms, or an aralkyl group of 6 to about 10 carbon atoms;

R^2 and R^3 each independently represents hydrogen, an alkyl or substituted alkyl group of 1 to about 6 carbon atoms, an aryl or substituted aryl group of 6 to about 10 carbon atoms, or an aralkyl group of 6 to about 10 carbon atoms; and

R^4 represents hydrogen or one or more alkyl or alkoxy groups having from 1 to about 4 carbon atoms, methylenedioxy groups or ethylenedioxy groups.

4,481,288

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yoshitaka Yamada; Toshifumi Iijima; Toshihiko Yagi; Yoshihiro Haga; Kenji Kumashiro, and Hiroshi Menjo, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 542,372

Claims priority, application Japan, Oct. 19, 1982, 57-184174

Int. Cl.³ G03C 1/46, 1/02

U.S. Cl. 430—506 **5 Claims**

1. A light-sensitive silver halide photographic material having at least one silver halide emulsion layer constituted of a plural number of layers which are substantially the same in color to which they are sensitive but different in sensitivity provided on a support, which comprises a layer having the highest sensitivity among the plural number of layers with different sensitivities which contains at least two kinds of substantially mono-dispersed silver halide grains with different average grain sizes, the average grain size (X_1) of the mono-dispersed silver halide grains having the largest average grain size and the average grain size (X_2) of the mono-dispersed silver halide grains having the second largest average grain size among the mono-dispersed silver halide grains with different average grain sizes satisfying the correlation formula (I) shown below:

Correlation formula (I):

$$0.1 \leq \log (X_1/X_2)^2 \leq 0.6.$$

4,481,289

METHOD FOR MANUFACTURING PHOTOGRAPHIC SUPPORT

Shigeo Honma, Kawasaki, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,296

Claims priority, application Japan, Mar. 23, 1981, 56-42105

Int. Cl.³ G03C 1/86

U.S. Cl. 430—532 **20 Claims**

1. A method for manufacturing a silver halide photographic material comprising a polyolefin-coated paper support and at least one layer of a photosensitive silver halide emulsion provided thereon, which comprises

subjecting a travelling uncoated base paper to corona discharge treatment on the side on which a molten polyolefin resin is to be coated and, thereafter, on which the layer of a photosensitive silver halide emulsion is to be provided;

extruding the molten polyolefin resin containing from 5 to 15% by weight of white pigment at a resin temperature at an extruder exit of from 250° to 300° C., the molten polyolefin resin being extrusion-coated on the side of the base paper on which the photographic silver halide emulsion is to be provided;

exposing the side of said molten polyolefin resin to be brought into contact with said base paper to an ozone-containing gas blown against said molten resin in an amount of ozone of from 10 to 200 mg/m^2;

extrusion-coating the base paper with said molten polyolefin resin to prepare the polyolefin-coated paper support; and

providing at least one layer of a photosensitive silver ahlide emulsion on the polyolefin resin layer of the polyolefin-coated paper support.

2. A method according to claim 1 wherein the polyolefin resin is polyethylene, polypropylene or an ethylenepropylene copolymer.

3. A photographic support obtained by the method of claim 2.

4,481,290

COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIALS

Shinzo Kishimoto, and Kiyohiko Yamamuro, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1983, Ser. No. 480,045

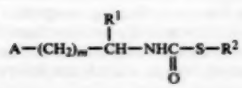
Claims priority, application Japan, Mar. 29, 1982, 57-50368

Int. Cl.³ G03C 7/26

U.S. Cl. 430—543 **30 Claims**

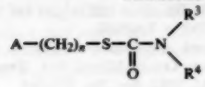
1. In a color photographic silver halide light-sensitive material having at least one light sensitive silver halide emulsion layer containing color-forming coupler(s); the improvement wherein the light-sensitive material has at least one layer containing at least one compound selected from the group consisting compounds represented by the general formulae (I-a) and (I-b):

Formula (I-a)

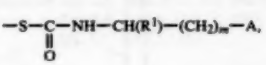


-continued

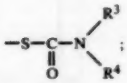
Formula (I-b)



wherein A represents an amino group or a nitrogen-containing heterocyclic radical, which may be substituted; R^1 represents a hydrogen atom or a carboxyl group; R^2 represents a monovalent metal atom, an ammonium group, an alkyl group which may be substituted, a group



or a group



R^3 and R^4 each represent a hydrogen atom, or an alkyl group which may be substituted by a hydroxyl group, an alkoxy group, a halogen atom, a carboxyl group, a group $—SO_2H$, a group $—SO_3H$, or the group represented by A; m is 1 or 2; and n is an integer of from 2 to 4.

4,481,291

PROCESS FOR DETERMINING STREPTOCOCCAL DESOXYRIBONUCLEASE B ACCORDING TO THE TOLUIDINE BLUE O METHOD

Reiner Gils, Wetter, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 309,815, Oct. 8, 1981, abandoned. This application Sep. 2, 1983, Ser. No. 528,998

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038286

Int. Cl.³ C12Q *1/68, 1/42;* G01N *33/54*

U.S. Cl. 435—6 **6 Claims**

1. A process for determining desoxyribonuclease B, which comprises adding a DNA/toluidine blue O complex to a serial dilution of a solution of desoxyribonuclease B, or of a solution of anti-desoxyribonuclease B to which a defined excess quantity of desoxyribonuclease B has previously been added, introducing an amount of an agent sufficient to effect precipitation of toluidine blue O, said agent being both sodium hydroxide and sodium choride in solution or being both sodium hydroxide and glycine in solution, into said serial dilution and then incubating said serial dilution under conditions suitable for said precipitation of toluidine blue O to occur, measuring the lowest dilution at which precipitation occurs and correlating that with the amount of desoxyribonuclease B resulting in that precipitation.

4,481,292

PROCESS FOR THE GENERATION OF ACETALDEHYDE FROM ETHANOL

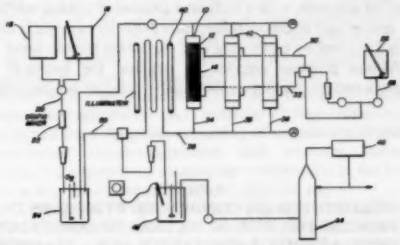
Wynn R. Raymond, Longwood, Fla., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Jul. 1, 1980, Ser. No. 165,033

Int. Cl.³ C12P *7/24*

U.S. Cl. 435—147 **29 Claims**

1. In a process for the enzyme-catalyzed conversion of ethanol to acetaldehyde wherein ethanol is reacted in the presence of alcohol dehydrogenase and nicotinamide adenine dinucleotide to form acetaldehyde, the improvement comprising conducting said reaction in the presence of tris (hydroxymethyl) aminomethane at conditions at which acetaldehyde formed in the reaction forms an associated complex with said tris (hydroxymethyl) aminomethane, and recovering acetaldehyde from said associated complex.



4,481,293

METHOD FOR THE PRODUCTION OF METHANE

Ove Thomsen, Växjö, and Peter Rönnow, Mölnlycke, both of Sweden, assignors to A-Betong AB, Växjö, Sweden

Division of Ser. No. 170,673, Nov. 6, 1979, Pat. No. 4,356,269. This application Jul. 19, 1982, Ser. No. 399,810

Claims priority, application Sweden, Mar. 6, 1978, 7802501

Int. Cl.³ C12P *5/02*

U.S. Cl. 435—167 **1 Claim**

1. A method for the production of methane from a biomass substrate by culture with anaerobic microorganisms in a processing chamber from which the methane is collected, which comprises the steps of:

(a) introducing a fresh supply of organic substrate into an antechamber;

(b) heating said introduced substrate within said antechamber up to at least 70° C.;

(c) mixing and circulating said heated substrate within said antechamber to equalize the temperature throughout said substrate;

(d) cooling portions of said heated substrate by heat exchange with fresh portions of substrate introduced at step (a), to temperatures in the range 50°–60° C. suitable for culturing and growth of said anaerobic micro-organisms;

(e) transferring said so-cooled portions of said substrate to a processing chamber in the presence of a methane-producing anaerobic micro-organism to form a substrate for the culture of said micro-organism contained therein;

(f) maintaining said cultured substrate under anaerobic conditions to promote growth of said micro-organism, until methane is generated; and

(g) collecting the generated methane, and discharging from said processing chamber the spent portions of said substrate, converted to fertilizer by the growth of said micro-organism, the rate of transfer of cooled substrate portions from said antechamber to said processing chamber in step (e) being equilibrated to the rate of discharge from said processing chamber in step (g) to maintain optimum growth conditions and substrate volume within said processing chamber.

4,481,294

PROCESS FOR CELL DISRUPTION

John D. Downs, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 20, 1982, Ser. No. 435,438

Claims priority, application United Kingdom, Nov. 3, 1981, 8133059

Int. Cl.³ C12N *1/06;* C07G *17/00;* C13L *3/00;* C12R *1/38*

U.S. Cl. 435—259 **8 Claims**

1. A process for disrupting cells to produce a substantially cell-free polysaccharide which comprises contacting an aque-

ous cell-containing broth, obtained by the fermentation of a nutrient medium with a polysaccharide-producing slime forming species of Pseudomonas microorganism resistant to disruption by enzymes, with a sufficient amount of anionic surfactant to render said microorganism susceptible to enzymatic disruption followed by contacting said surfactant treated broth with sufficient protease enzyme to degrade the bacterial cells therein and recovering a substantially cell-free polysaccharide.

4,481,295

SUBSTITUTED OR CONDENSED PYRIDINES IN A PROCESS FOR THE DETECTION OF SUBSTANCES HAVING A PEROXIDATIC EFFECT AND A DIAGNOSTIC AGENT CONTAINING SUCH PYRIDINES

Klaus Habenstein, Lahntal, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

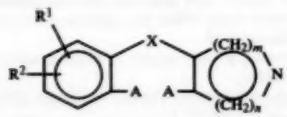
Filed Jun. 27, 1980, Ser. No. 163,691

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926271

Int. Cl.³ G01N *33/52, 33/72, 21/78*

U.S. Cl. 436—66 **9 Claims**

1. A method for detecting a substance having a peroxidative effect, which method comprises contacting said substance with a hydroperoxide and a chromogen in the presence of an activator which is a compound of the formula



or a salt thereof, wherein

X is $—CH_2—$, $—CHR_1—$, $—CR_1R_2—$, $=C=O$, or a chemical bond,

m and n are each an integer from 0 to 3 inclusive and $m+n=3$;

A is hydrogen if X is $=C=O$ or a chemical bond and

A is hydrogen or a chemical bond if X is $—CH_2—$, $—CHR_1$, or $—CR_1R_2—$; and

R_1 and R_2 are hydrogen, halogen, or alkyl having 1 to 4 carbon atoms,

whereby a color change in said chromogen is indicative of the presence of such a substance having a peroxidative effect.

4,481,296

COLOR INDICATOR SYSTEM FOR PH MEASUREMENT

James L. Halley, Mableton, Ga., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Feb. 15, 1983, Ser. No. 466,432

Int. Cl.³ G01N *21/80*

U.S. Cl. 436—163 **11 Claims**

6. A method of measuring pH of an aqueous system comprising the steps of:

withdrawing a representative sample from the aqueous system;

adding to the representative sample a composition comprising phenol red, phenol in an amount effective to bind halogens present in the sample and deionized water thereby forming an analysis sample; and

observing a color change or lack thereof in the representative sample.

4,481,297

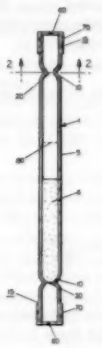
VAPOR DETECTION TUBE AND METHOD OF TESTING FOR A VAPOR

Thomas A. Zucal, Richland, and John D. McIntosh, Newfield, both of N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 13, 1982, Ser. No. 377,764

Int. Cl.³ G01N *1/22, 31/06*

U.S. Cl. 436—181 **7 Claims**



3. A method for collecting for subsequent testing a vapor using a vapor detection tube comprising a glass tube having an adsorbent inside, the tube having a middle portion and first and second ends with a constriction near each end and the ends of the tube being open, and there being heat shrunk plastic cap sealing means for sealing the first and second ends of the tube for safe and contamination free handling, the method comprising the steps of:

A. removing easily and cleanly the cap sealing means from each end of the tube to provide a clean end free from shipping and handling damage;

B. breaking uniformly and cleanly the first and second ends of the tube at each constriction to provide an open tube for sampling with a clean, precise and uniform opening at each end;

C. placing the tube in a sampling line; and

D. drawing a sample through the tube to collect a clean and uniformly-drawn sample inside the tube on the adsorbent.

4,481,298

PRE-PRECIPITATED DOUBLE ANTIBODY IMMUNOASSAY METHOD

Robert O. Cone, Jr., and Charles R. Carpenter, both of Seguin, Tex., assignors to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 253,659, Apr. 13, 1981, Pat. No.

Int. Cl.³ G01N *33/54, 33/78*

U.S. Cl. 436—500 **34 Claims**

1. An immunoassay process for the detection of antigen in a sample, which comprises:

a. forming a mixture of said sample in an appropriate medium therefor with

1. a preformed antigen-binding complex of a primary antibody having specificity for said antigen and containing a F_c region, and a secondary antibody having specificity only for F_c region of said primary antibody; wherein said secondary antibody is affinity purified; and with

2. A detectably labeled form of said antigen;

b. incubating said mixture formed in step (a), which comprises said complex suspended in said medium, for a time sufficient to allow said antigen and said detectably labeled antigen to competitively bind to the primary antibody of said preformed complex;

c. Separating said complex containing bound labeled antigen from said suspension medium; and

d. detecting said separated complex containing bound labeled antigen, or said separated suspension medium containing free labeled antigen.

4,481,299

OPTICAL GLASS

Hidemi Tajima, Tokyo, Japan, assignor to Hoya Corporation, Tokyo, Japan

Continuation of Ser No. 428,512, Sep. 29, 1982, abandoned. This application Apr. 23, 1984, Ser. No. 602,104

Claims priority, application Japan, Oct. 1, 1981, 56-154854

Int. Cl.³ C03C *3/10*

U.S. Cl. 501—73 **1 Claim**

1. An optical glass consisting essentially of, in % by weight

21.7 to 32.4% SiO_2;

0 to 9.5% B_2O_3;

0 to 3.0% Al_2O_3;

0.5 to 3.0% Li_2O;

34.2 to 49.3% BaO+SrO+CaO+MgO+ZnO, with the proviso of

19.4 to 36.8% BaO,

0 to 10.0% SrO,

0 to 17.0% CaO,

0 to 5.0% MgO, and

2.3 to 17.5% ZnO;

11.1 to 23.0% La_2O_3;

2.5 to 6.0% ZrO_2;

0 to 7.1% TiO_2;

0 to 3.8% $Nb_2O_5+Ta_2O_5$;

0 to 3.0% WO_3; and

0 to 5.0% PbO,

said optical glass having a refractive index (nd) of 1.672 to 1.735 and an Abbe Number (νd) of 39.9 to 51.5, and being free of CdO and ThO_2.

4,481,300

ALUMINUM OXYNITRIDE HAVING IMPROVED OPTICAL CHARACTERISTICS AND METHOD OF MANUFACTURE

Thomas M. Hartnett, Nashua, N.H.; Richard L. Gentilman, Acton, and Edward A. Maguire, Ashland, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 297,897, Aug. 31, 1981, abandoned. This application Jan. 13, 1984, Ser. No. 570,420

Int. Cl.³ C04B *35/58*

U.S. Cl. 501—98 **8 Claims**

1. A body of polycrystalline cubic aluminum oxynitride material having a density of at least 99% of theoretical density, a sample of said body having an in-line transmission of at least 50% in the wavelength range of 0.3–5 microns said sample having a thickness of 1.45 millimeters.

4,481,301

HIGHLY ACTIVE CATALYST COMPOSITION FOR POLYMERIZING ALPHA-OLEFINS

Thomas E. Nowlin, Somerset, and Klaus P. Wagner, East Windsor, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 327,534, Dec. 4, 1981,. This application Nov. 24, 1982, Ser. No. 444,152

Int. Cl.³ C08F *4/02, 4/64*

U.S. Cl. 502—104 **16 Claims**

1. A process for preparing a supported catalyst composition for use in alpha-olefin polymerization reactions, said process comprising the steps of:

(i) contacting a solid, porous carrier having reactive OH groups with a liquid in the absence of ball milling, said liquid containing at least one organomagnesium composition having the empirical formula

$$R_nMgR'_{(2-n)} \quad (I)$$

where R is unsubstituted C_1–C_{12} alkyl, R' is Cl, Br or I, and n is a rational number from about 0.5 to 2, the number of moles of said organomagnesium composition being in excess of the number of moles of said OH groups on said carrier, whereby said organomagnesium composition is reacted with said OH groups on said carrier;

(ii) evaporating said liquid from step (i) to precipitate magnesium onto said carrier, said precipitated magnesium being selected from the group consisting of magnesium dihalide, unreacted organomagnesium and mixtures thereof, whereby a supported magnesium composition in the form of a dry, free-flowing powder is formed; and

(iii) reacting said powder of step (ii) with at least one tetravalent titanium compound in a liquid medium, the number of moles of said tetravalent titanium compound being in excess of the number of OH groups on said carrier prior to reaction with said organomagnesium composition in step (i), said tetravalent titanium compound being soluble in said liquid medium, and said supported magnesium composition being essentially insoluble in said liquid medium, whereby a reacted form of titanium which is insoluble in said liquid medium becomes supported on said carrier.

4,481,302

CHROMIUM ON MIXED METAL PHOSPHATE BASE WITH ORGANOBORON COCATALYST

Max P. McDaniel, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 27, 1983, Ser. No. 461,318

Int. Cl.³ C08F *4/02, 4/62*

U.S. Cl. 502—150 **16 Claims**

1. A catalyst system comprising:

(a) a catalyst comprising a chromium component on a xerogel base comprising 75–99 mole percent aluminum phosphate and 1 to 25 mole percent of a phosphate of at least one other metal selected from gallium, yttrium, zirconium, lanthanum, neodymium and thorium; and

(b) an organoboron cocatalyst.

4. A catalyst system according to claim 1 wherein said cocatalyst is triethylborane.

14. A method for making a catalyst system comprising:

(1) forming a catalyst by

(a) forming a hydrogel comprising 75–99 mole percent aluminum phosphate and 1 to 25 mole percent of a phosphate of at least one other metal selected from gallium, yttrium, zirconium, lanthanum, neodymium and thorium;

(b) removing water from said hydrogel to form a xerogel;

(c) treating said xerogel at an elevated temperature in an oxidizing atmosphere;

(d) introducing a chromium component either by coprecipitating the chromium component with said hydrogel or adding said chromium component to said hydrogel or adding said chromium component anhydrously to said xerogel prior to said treating in said oxidizing atmosphere; and

(2) combining said catalyst with an organoboron cocatalyst.

4,481,303

ELECTRODE MATERIAL

James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 333,592, Dec. 23, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 520,979

Int. Cl.³ H01M *4/86*

U.S. Cl. 502—159 **8 Claims**

1. A particle suitable for use as an electrode material comprising:

a generally spherical substrate selected from the group of

materials consisting of steel, iron, graphite, nickel, platinum, copper and silver, said substrate being substantially completely coated with an admixture of a hydrophobic binder and an electrochemically active, electrically conductive catalyst selected from the group consisting of silver, carbon black, platinum, activated carbon and mixtures thereof

wherein said particle has a diameter of from about 0.7 mm to about 2.5 cm and said coating has a thickness of from about 1 mil to about 5 mils.

4,481,304

CATALYST FOR PRODUCING PHTHALIC ANHYDRIDE

Takahisa Sato; Yoshiyuki Nakanishi; Keizo Maruyama, all of Himeji, and Takehiko Suzuki, Obtsu, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Continuation of Ser. No. 254,420, Apr. 15, 1981, abandoned, which is a division of Ser. No. 97,982, Nov. 28, 1979, Pat. No. 4,284,571. This application Aug. 29, 1983, Ser. No. 527,198

Claims priority, application Japan, Nov. 29, 1978, 53-146459

Int. Cl.[3] **B01J** *27/14, 27/20*

U.S. Cl. 502—209 **9 Claims**

1. A catalyst suitable for the production of phthalic anhydride by the catalytic vapor-phase oxidation of o-xylene or naphthalene, said catalyst comprising catalytically active material composed of 1 to 20 parts by weight as V_2O_5 of vanadium oxide, 99 to 80 parts by weight of anatase-type titanium oxide being porous and having a particle diameter substantially of 0.4 to 0.7 micron and a specific surface area of 10 to 60 m^2/g, said porous titanium oxide being an agglomerated mass of primary particles having a particle diameter of 0.05 to 0.20 micron, and per 100 parts by weight of the sum of said two components, 0.01 to 1 part by weight as Nb_2O_5 of niobium oxide, 0.05 to 1.2 parts by weight as an oxide of at least one ingredient selected from the group consisting of potassium, cesium, rubidium and thallium, and 0.2 to 1.2 parts by weight as P_2O_5 of phosphorus, and a porous carrier having an alumina content of not more than 10% by weight, a silicon carbide content of at least 80% by weight and an apparent porosity of at least 10% supporting said catalytically active material thereon, wherein the total volume of pores having a diameter of 0.15 to 0.45 micron present in the layer of the catalytically active material on the carrier is at least 50% of that of pores having a diameter of not more than 10 microns present in said layer of the catalytically active material.

4,481,305

PROCESS FOR THE PREPARATION OF HYDROCARBONS

Ernest Jorn, Lyngby, and Jens R. Rostrup-Nielsen, Virum, both of Denmark, assignors to Haldor Topsoe A/S, Lyngby, Denmark

Filed Sep. 6, 1983, Ser. No. 529,796

Claims priority, application Denmark, Sep. 7, 1982, 3990/82

Int. Cl.[3] **C07C** *1/04, 1/20*

U.S. Cl. 518—705 **10 Claims**

1. A catalytic process for preparing hydrocarbons that by converting a synthesis gas containing hydrogen and carbon oxides at a mole ratio CO/H_2 above 1, which comprises, in combination, the steps of

(i) forming a feed gas by combining

(α) a synthesis gas, optionally after having subjected it wholly or partly to a wash to remove at least some carbon dioxide therefrom,

(β) a first recycle stream separated off from the effluent from a second reactor as defined below, said first recycle stream containing hydrogen, carbon oxides, lower hydrocarbons and optionally inert gases, and

(γ) steam in an amount such that the feed gas, when equilibrated according to the reaction (3) defined below will obtain a CO/H_2 mole ratio of about 1,

the content of CO_2 in the fresh synthesis gas and the first recycle stream being adjusted so as to obtain a mole ratio CO/CO_2 of 5 to 20 in the feed gas thus formed,

(ii) passing the feed gas thus formed to a first reactor and converting it in said first reactor at a pressure of 5–100 bar and a temperature of 150°–400° C. in the presence of one or more catalysts which together catalyse the reactions

$$CO+2H_2 \rightleftharpoons CH_3OH, \quad (1)$$

$$2CH_3OH \rightleftharpoons CH_3OCH_3+H_2O, \text{ and} \quad (2)$$

$$CO+H_2O \rightleftharpoons CO_2+H_2 \quad (3)$$

to form a first intermediate containing methanol and in said first reactor converting at least a substantial part of the methanol further into dimethyl ether so as to form a second intermediate containing dimethyl ether,

(iii) passing the entire effluent from said first reactor to an adiabatic, second reactor after having combined said effluent with a second recycle stream separated off from the effluent from said second reactor, said second recycle stream containing low-boiling constituents,

(iv) to complete in said reactor at substantially the same pressure as in the first reactor and at a temperature of about 150°–600° C. the conversion of the synthesis gas in the presence of at least one catalyst which catalyses the conversion of the gas fed to said second reactor into a gas mixture containing hydrocarbons, and

(v) dividing the effluent from the second reactor into several streams as follows:

(a) a stream, mainly containing water and being conducted away,

(b) a purge stream containing hydrogen, carbon oxides, lower hydrocarbons and inert gases and being conducted away,

(c) the first recycle stream, having the same composition as the purge stream (b), and being recycled so as to form component (β) of the feed gas for the first reactor, at least part of said first recycle stream being subjected to a wash to remove part of the content of CO_2 therein so as to ensure, optionally together with wash of part of the fresh synthesis gas denoted component (α), the desired mole ratio CO/CO_2 of 5 to 20 in the feed gas,

(d) the second recycle stream containing low-boiling components of said effluent from the second reactor and

(e) at least one stream containing the desired product of hydrocarbons.

4,481,306

POLYMERIZATION PROCESS

Michael V. Markus, East Malvern, and George H. Barnett, North Balwyn, both of Australia, assignors to ICI Australia Limited, Victoria

PCT No. PCT/AU82/00126, § 371 Date Mar. 25, 1983, § 102(e) Date Mar. 25, 1983, PCT Pub. No. WO83/00487, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 6, 1982, Ser. No. 482,332

Claims priority, application Australia, Aug. 7, 1981, PF0111

Int. Cl.[3] **C08F** *8/00, 259/08;* **B01J** *1/00*

U.S. Cl. 521—31 **26 Claims**

1. A process of preparing a cation exchange resin which process comprises radiation grafting with copolymerization onto a perhalogenated fluorine-containing hydrocarbon polymeric skeletal substance at least one functional monomer selected from the group consisting of compounds of formula I:

$$CF_2=CF(CF_2)_nA$$

and formula II

$$CF_2=CF\text{-}O\text{-}(CFX\text{-}CFX)_mA$$

wherein A is carboxyl or C_1 to C_6 alkoxycarbonyl, one X is fluorine and the other X is selected from chlorine, fluorine and

a trifluoromethyl group, n is an integer from 0 to 12, m is an integer from 1 to 3; together with at least one non-functional linking monomer selected from the group consisting of compounds of formula III:

$$CF_2{=}CFY$$

wherein Y is chlorine, fluorine, or a trifluoromethyl group, the molar ratio of functional monomer to non-functional linking monomer being in the range of 9:1 to 1:20, said grafting being carried out with said mixture of monomers in the presence of at least one polymerization inhibitor and at least one chain transfer agent, such that least 40.7 percent grafting is accomplished.

4,481,307

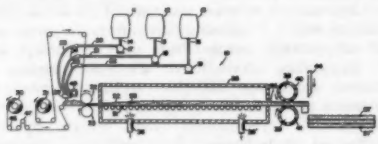
POLYOXYALKYLENE/UNSATURATED DIESTER REACTION PRODUCT FOR CELLULAR FOAM STABILIZATION

Richard L. Frentzel, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 426,581, Sep. 29, 1982, Pat. No. 4,418,158, which is a division of Ser. No. 282,322, Jul. 10, 1981, Pat. No. 4,365,024. This application Oct. 21, 1983, Ser. No. 544,301

Int. Cl.³ C08J 9/14

U.S. Cl. 521—115 **17 Claims**



1. In the method of preparing a cellular foam from:

A. polyisocyanurate polymer forming reactants, and

B. a blowing agent, the improvement which comprises utilizing as surfactant the reaction product of

(a) a polyoxyalkylene adduct having the formula

$$H{-}(\text{polyoxyalkylene chain})_tR,$$

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R, and

(b) an esterified unsaturated dibasic acid having the formula

$$T^1O_2C{-}C_uH_{2u-2}{-}CO_2T^2$$

wherein u is 2 or 3 and T^1 and T^2 are identical or different and represent a straight or branched, saturated or unsaturated hydrocarbon chain, in the presence of an effective amount of a free-radical initiator and wherein the polyoxyalkylene adduct optionally is treated either before or after its reaction with the esterified unsaturated dibasic acid with a capping agent capable of reacting with the hydroxyl groups of said adduct to reduce the hydroxyl number of said adduct to less than 50.

4,481,308

PRETREATMENT METHOD OF PRODUCING FIRE RETARDANT FOAM

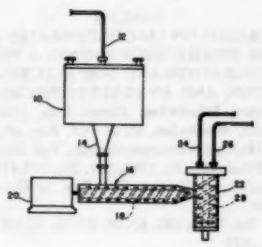
Stanley D. Gray, Greensboro, N.C., assignor to Anti-Fire Foam, Inc., Atlanta, Ga.

Filed May 3, 1983, Ser. No. 491,308

Int. Cl.³ C08G 18/14

U.S. Cl. 521—120 **18 Claims**

1. A method of producing a fire retardant flexible polyurethane foam material which comprises mixing urea with at least one of the foam producing reactants prior to combining or at the time of combining such reactants to produce the flexible polyurethane foam material.



4,481,309

PROCESS FOR THE PREPARATION OF CELLULAR AND NON-CELLULAR POLYURETHANES

Wolfgang Straehle, Heidelberg; Ingolf Buethe, Boehl-Iggelheim, and Matthias Marx, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,246

Int. Cl.³ C08G 18/14

U.S. Cl. 521—172 **12 Claims**

1. In a process for the preparation of cellular or non-cellular polyurethanes through the reaction of an organic polyisocyanate with a polyol component in the presence of suitable catalysts and, in some cases, chain extenders or cross-linking agents, blowing agents, and auxiliaries or additives; wherein the improvement comprises utilizing as said polyol component an isocyanate-reactive polyol containing from 30 percent to 100 percent by weight of di- to tetrafunctional polyether-polyester polyols having hydroxyl numbers from 10 to 200 prepared by the process of:

(a) esterifying di- to tetrafunctional polyether polyols having hydroxyl numbers from 15 to 250 with carboxylic acid anhydrides to form carboxylic acid half esters, and

(b) oxyalkylating of the carboxylic acid half esters with alkylene oxides in the presence of a catalyst selected from the group consisting of:

(i) N-methylimidazole,

(ii) triethylenediamine,

(iii) triphenylphosphine,

(iv) mixtures of two or more of (i), (ii), and (iii), and

(v) a mixture of thiodialkylene glycol and at least one of (i), (ii), and (iii).

4,481,310

FURFURYL ESTERS AND RESINS

Wayne D. Woodson, Danville, Ill., assignor to CL Industries, Inc., Danville, Ill.

Continuation of Ser. No. 306,965, Sep. 30, 1981, abandoned. This application Jun. 14, 1983, Ser. No. 503,081

The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.

Int. Cl.³ C08F 32/06; B22C 11/22

U.S. Cl. 523—144 **11 Claims**

1. An acid curable resin binder composition for sand cores or molds comprising

an admixture of an acid curable condensation-type resin precondensate, and

a dibasic acid di-ester of the composition

$$R^1O_2C(CH_2)_xCO_2R^2$$

where n is from 1 to 8, R^1 is furfuryl, and R^2 is furfuryl or methyl.

4,481,311

BINDERS BASED ON CO-CONDENSATES OF EPOXY RESINS AND RESOLS WITH AMINES A PROCESS FOR THEIR PREPARATION AND FOR ELECTROPHORETIC DEPOSITION, AND AN ELECTROPHORESIS BATH

Wolfgang Hesse, Wiesbaden; Jürgen Ritz, Mainz, and Rolf Zimmermann, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,473

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3135010

Int. Cl.³ C08L *61/06, 61/10, 62/00*

U.S. Cl. 523—424 **13 Claims**

1. A binder comprising a co-condensate

(a) a partially defunctionalized epoxy resin which still contains, on average, 0.5 to 1.3 epoxy groups per molecular unit and has a molecular weight of from 500 to 5,000,

(b) a resol comprising methylol compounds of oligomethylenephenols which are unsubstituted or substituted by hydrocarbon or hydroxyalkyl or hydroxyaralkyl groups and

(c) an amine containing at least one primary or secondary amino group, a substituent selected from the group consisting of alkyl substituents, alkanol substituents and both, and at most two hydroxyl groups, the weight ratio of epoxy resin to resol being between 20:80 and 80:20 and the molar ratio of epoxide groups to amines being in the range of from 1:0.1 to 1:1.

12. An aqueous electrophoresis bath for carrying out an electrophoretic deposition of a cationic resin from an aqueous dispersion onto an article connected as the cathode, which contains a binder as claimed in claim 1, the pH being between 3.0 and 9.0.

4,481,312

SHEET STRUCTURES AND FIBERS CONTAINING BURR-SHAPED OR FIBROUS, DOPED POLYACETYLENE PARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

Jürgen Hocker, Bergisch-Gladbach; Rudolf Merten, Leverkusen, and Bernd Willenberg, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,093

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113329

Int. Cl.³ C08L *49/00;* **C08J** *5/02;* **C08K** *3/02, 3/16*

U.S. Cl. 524—40 **6 Claims**

1. A process for coating or impregnating a substrate which comprises

(1) applying a coating composition to the substrate, said composition comprising solvent, a plastic material dissolved in the solvent, and polyacetylene particles which are doped and are burr-shaped or fibrous and

(2) removing the solvent from the composition applied to the substrate.

4,481,313

PROCESS FOR INSTANTANEOUS PEPTIZATION OF CHLOROPRENE-SULFUR COPOLYMERS

Edward M. Banta, Baytown, and Kenneth D. Fitzgerald, Sugarland, both of Tex., assignors to Denka Chemical Corporation, Houston, Tex.

Filed Dec. 6, 1982, Ser. No. 447,206

Int. Cl.³ C08L *45/00, 47/00*

U.S. Cl. 524—84 **22 Claims**

1. A peptization composition for peptizing chloroprene-sulfur copolymers comprising a latex of chloroprene-sulfur copolymers, tetraethyl thiuram disulfide and water soluble salt of mercaptobenzothiazole.

4,481,314

INFRARED RADIATION ABSORBENT ANTHRAQUINONE DERIVATIVES IN POLYESTER COMPOSITIONS

Mark Rule, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1983, Ser. No. 509,112

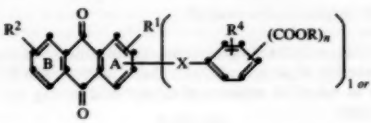
Int. Cl.³ C08K *5/42, 5/18;* **C09K** *15/24*

U.S. Cl. 524—88 **14 Claims**

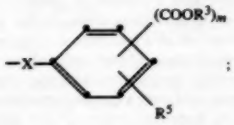
1. A polyester composition comprising linear thermoplastic polyester containing from about 1 to about 20,000 ppm of one or a mixture of infrared absorbent compounds comprising anthraquinone having in the 1, 4, 5 and 8-positions diamino radicals independently selected from those of the formula

wherein R^6 and R^7 are each selected independently from hydrogen, straight or branched alkyl radicals, cycloalkyl radicals, and aryl radicals, wherein said radicals are unsubstituted or substituted with 1–3 radicals different from the parent radical and independently selected from alkyl, cycloalkyl, aryl, alkoxy, alkylamino, alkylsulfonyl, alkylsulfonylamino, alkanoylamino, aroylamino, alkylthio, arylamino, amino, cycloalkylamino, alkanoyl, alkoxycarbonyl, alkanoyloxy, aroyl, arylsulfonyl, CF_3, arylsulfamoyl, cyano, halogen, hydroxy, nitro, sulfamoyl, alkylsulfamoyl, dialkylsulfamoyl, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, SO_3M, OSO_3M, $COOR^8$ wherein R^8 is H, lower alkyl or lower hydroxyalkyl, and wherein M is H^+, Na^+, K^+or NH_4+.

2. The composition of claim 1 containing a coloring amount of a dye component comprising the copolymerized residue of one or a mixture of dyes of the formula



wherein: either or both of rings A and B may contain in any position thereon one or two groups of the formula



R and R^3 each is hydrogen, lower alkyl or lower hydroxy alkyl; R^1, R^2, R^4 and R^5 each represents hydrogen or 1–3 substituents independently selected from lower alkyl, lower alkyl substituted with lower alkoxy, phenyl, Cl, Br, or lower alkanoylamino, lower alkoxy, lower alkoxy substituted with lower alkoxy, phenyl, Cl, Br, or lower alkanoylamino, chlorine, bromine, amino, lower alkylamino, lower alkylamino substituted with lower alkoxy, cyclohexyl, phenyl, Cl, Br, or lower alkanoylamino, arylamino, arylthio, aroylamino, lower alkylsulfonyl, lower alkylthio, lower alkanoylamino, and cyclohexylamino, wherein X is —S— or —NH—; n is 1 or 2; and m is 0, 1, or 2.

7. The composition of claim 2 wherein the polyester is pre-

pared from at least about 90 mole % terephthalic acid and a diol component comprised of at least about 90 mole % ethylene glycol, up to about 10 mole % 1,4-cyclohexanedimethanol, and up to about 5 mole % diethylene glycol, each dye is present in reacted form in a concentration of from about 2.0 to about 1500 ppm, and wherein from about 5 to about 200 ppm of copper phthalocyanine is admixed therewith, said parts being per million parts of the polyester.

4,481,315

POLYALKYLPIPERIDINE LIGHT STABILIZERS

Jean Rody, Riehen, and Mario Slongo, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

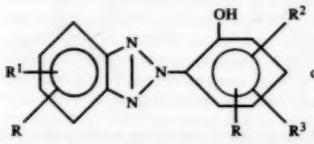
Continuation of Ser. No. 266,873, May 26, 1981, abandoned, which is a division of Ser. No. 76,106, Sep. 17, 1979, Pat. No. 4,289,686. This application Feb. 28, 1983, Ser. No. 470,742

Claims priority, application Switzerland, Sep. 27, 1978, 7810088

Int. Cl.³ C08K 5/34

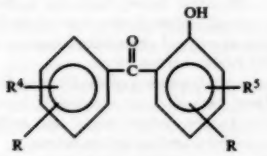
U.S. Cl. 524—89 **12 Claims**

1. A compound of the formula A—B or A—Z—B wherein A is one of the groups



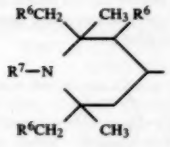
(A I)

or

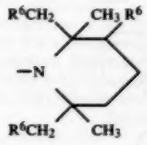


(A II)

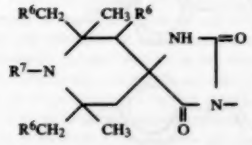
and B is one of the groups



(B I)

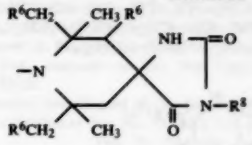


(B II)

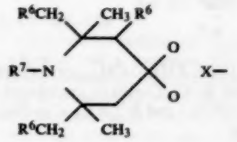


(B IV)

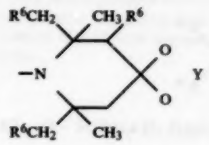
-continued



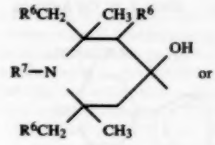
(B V)



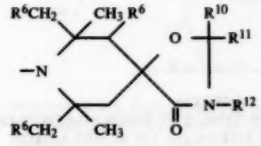
(B VII)



(B VIII)

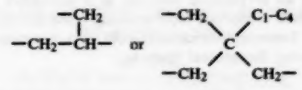


(B X)



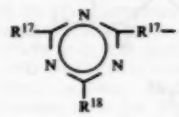
(B XII)

in which one R is H and the other R is a free valency; R^1 is H, Cl, C_1–C_4 alkyl, OH or C_1–C_4 alkoxy; R^2 and R^3 independently of one another are H, Cl, C_1–C_{12} alkyl, C_5–C_8 cycloalkyl, phenyl, C_7–C_9 phenylalkly, OH or C_1–C_{12} alkoxy; R^4 and R^5 independently of one another are H, Cl, OH, C_1–C_{12} alkoxy or C_1–C_{12} alkyl; R^6 is H or CH_3; R^7 is H, O, C_1–C_{12} alkyl, C_3–C_8 alkenyl, benzyl, acetyl or a group —CH_2—CH(OH)—R^{13}; R^8 is C_1–C_{12} alkyl, C_3–C_8 alkenyl or C_7–C_9 phenylalkyl; R^{10} and R^{11} are hydrogen, C_1–C_{12} alkyl, phenyl or benzyl, or R^{10} and R^{11} are together C_4–C_{19} alkylene; R^{12} is H; R^{13} is H, CH_3, C_2H_5 or phenyl; X is a



alkyl group; Y is C_2–C_8 alkylene; and —Z— is one of the following groups: —(CH_2)—CO—O—, —$(CH_2)_m$—CO—O—R^{14}—, —O—$(CH_2)_n$—CO—O—R^{14}—, —CH$_2$—CH(OH)—CH_2—O—CO—$(CH_2)_m$—, —O—CH_2—CH(OH)—CH_2—O—CO—$(CH_2)_m$—, —CH_2—CH(OH)—CH_2—, —CH_2—CH(OH)—CH_2—O—, —CH_2—CH(OH)—CH_2—N(R^{15})—$(CH_2)_m$—, —O—CH_2—CH(OH)—CH$_2$—N(R^{15})—$(CH_2)_m$—, —N(R^{15})—CH_2—CH(OH)—CH$_2$—N(R^{16})—$(CH_2)_m$—, —CH_2—CH(R^{13})—O—CH_2—CH(OH)—CH_2—N(R^{15})—$(CH_2)_m$—, —CH_2—CH(R^{13})—O—CH_2—CH(OH)—CH_2—O—CO—$(CH_2)_m$—, —$(CH_2)_m$—N(R^{15})—CO—, —$(CH_2)_m$—N(R^{15})—CO—$(CH_2$-

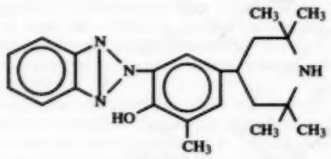
)$_n$—, —O—$(CH_2)_3$—N(R^{15})—CO—$(CH_2)_m$—, —CH_2—NH—CO—CH_2—O—, —CH_2—NH—CO—CH_2—O—CH(R^{13})—CH_2—, —CH_2—NH—CO—CH_2—N(R^{15})—$(CH_2)_m$—, —CH_2—NH—CO—CH_2CH_2—N(R^{15})—$(CH_2)_m$— or



in which m is 0, 1 or 2, n is 1 or 2, R^{14} is —CH_2— or —CH(R^{13})—CH_2—, R^{15} and R^{16} are H, C_1–C_{12}-alkyl, cyclohexyl or benzyl, R^{17} is —O— or —NR^{15}— and R^{18} is C_1–C_{12}-alkoxy, phenoxy or an amino group

or a group AII is linked to a group B via a radical —O—(CH_2)$_n$—CO—O—.

7. The compound according to claim 1, of the formula



4,481,316

METHOD FOR INHIBITING THE DEGRADATION OF AN AQUEOUS SOLUTION OF AN ACRYLAMIDE POLYMER IN A PETROLEUM RECOVERY PROCESS

Shoichi Kanda, and Gengiro Kawamura, both of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

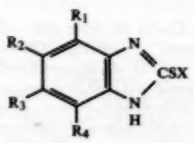
Continuation of Ser. No. 101,672, Dec. 10, 1979, Pat. No. 4,393,163, which is a continuation-in-part of Ser. No. 970,022, Dec. 14, 1978, abandoned. This application Dec. 22, 1982, Ser. No. 452,266

Claims priority, application Japan, Dec. 14, 1977, 52-149330; Nov. 6, 1978, 53-136440

Int. Cl.^{3} C08K *5/45*

U.S. Cl. 524—93 **4 Claims**

1. A method for inhibiting the degradation of an aqueous solution of an acrylamide polymer in a petroleum recovery process which comprises incorporating a stabilizing effective amount of 2-mercaptobenzoimidazole or a water-soluble salt thereof having the general formula



wherein R_1, R_2, R_3 and R_4 each represents a hydrogen atom or a lower alkyl group, and X represents a hydrogen atom, an alkali metal atom or an ammonium group, into an acrylamide polymer which is an acrylamide copolymer containing at least 50 mol % acrylamide and having the remaining amount of vinylmonomer selected from the group consisting of acrylic or methacrylic acid or salts thereof.

4,481,317

HINDERED BISPHENOL DIPHOSPHONITES AND STABILIZED SYNTHETIC RESIN COMPOSITIONS CONTAINING THE SAME

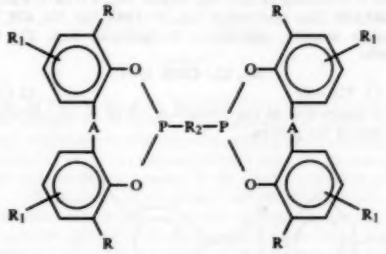
Yutaka Nakahara, Iwatsuki; Tohru Haruna, Okegawa, and Etsuo Tobita, Tokyo, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Jun. 7, 1983, Ser. No. 501,946

Int. Cl.^{3} C08K *5/53*; C07F *9/02*

U.S. Cl. 524—119 **38 Claims**

1. Hindered bisphenol diphosphonites having the structure:



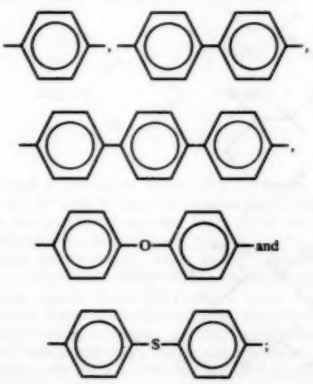
wherein:

A is selected from the group consisting of thio sulfur —S—; oxy oxygen —O—; alkylidene having from one to about ten carbon atoms; cycloalkylidene having from about four to about eight carbon atoms; and phenylalkylidene having from seven to about twelve carbon atoms;

R is selected from the group consisting of alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about twelve carbon atoms; and aralkyl having from seven to about twelve carbon atoms;

R_1 is selected from the group consisting of hydrogen; alkyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about twelve carbon atoms; and aralkyl having from seven to about twelve carbon atoms;

R_2 is selected from the group consisting of



4,481,318

SULFONATED POLYMER AND COMPOSITIONS THEREOF

Robert D. Lundberg, Bridgewater, and Warren A. Thaler, Aberdeen, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

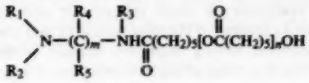
Continuation of Ser. No. 332,850, Dec. 21, 1981, Pat. No. 4,421,898. This application Sep. 29, 1983, Ser. No. 537,056

Int. Cl.³ C08K 5/09, 5/17, 5/20, 5/21

U.S. Cl. 524—211 5 Claims

1. A polymeric composition which comprises:

(a) a sulfonated polymer with about 10 to about 200 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonate groups being neutralized with a polycaprolactone polymer having the formula:



wherein n = 1 to 500, m = 1 to 20, R_1 or R_2 is selected from the group consisting of alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms, R_1 is selected from the group consisting of hydrogen, alkyl and cycloalkyl groups having about 1 to about 20 carbon atoms and aryl groups, and R_4 and R_5 are selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl groups, wherein said sulfonated polymer is formed from an elastomeric polymer selected from the group consisting of Butyl rubber and an EPDM terpolymer or from a polymer selected from the group consisting of polystyrene, poly-t-butylstyrene, polychlorostyrene and poly-2-methylstyrene, said polycaprolactone polymer having an $\overline{M}_n$ as measured by GPC of about 200 to about 50,000 and a melting point from below room temperature to about 55° C.;

(b) about 25 to about 150 parts by weight of a nonpolar process oil per 100 parts by weight of the sulfonated polymer;

(c) about 50 to about 300 parts by weight of a filler per 100 parts by weight of the sulfonated polymer; and

(d) at least about 3 parts by weight of a preferential plasticizer per 100 parts by weight of the sulfonated polymer.

4,481,319

LOW-FOAM SURFACE SIZING AGENTS FOR PAPER WHICH CONTAIN COPOLYMERIC MALEIC ANHYDRIDE SEMI-AMIDES

Günter Sackmann; Günter Kolb, both of Leverkusen; Joachim Probst, Cologne; Friedhelm Müller, Odenthal, and Heinz Bäumgen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 227,950, Jan. 23, 1981, abandoned, which is a continuation of Ser. No. 075,519, Sep. 13, 1979, abandoned. This application Aug. 24, 1982, Ser. No. 410,906

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1978, 2840650; Jul. 18, 1979, 2928984

Int. Cl.³ C08K 5/21, 5/05

U.S. Cl. 524—213 2 Claims

1. Low-foam surface sizing agents for paper in the form of aqueous or aqueous-alcoholic alkali metal, amine or ammonium salt solutions of copolymers containing carboxylic acid semi-amide groups obtainable by reacting substantially equimolar copolymers of maleic acid anhydride and diisobutylene and/or terpolymers of maleic acid anhydride, diisobutylene and a vinyl monomer copolymerizing with maleic acid anhydride, with from 15 to 40 mole percent, based on maleic acid anhydride groups, of n-butyl amine.

4,481,320

METHOD FOR REDUCING BLOCK OF ETHYLENE INTERPOLYMERS CONTAINING —COOH GROUPS

David P. Flores, and James A. Allen, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

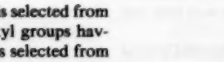
Continuation-in-part of Ser. No. 423,981, Sep. 27, 1982, , which is a division of Ser. No. 332,435, Dec. 21, 1981,. This application Feb. 24, 1984, Ser. No. 582,664

Int. Cl.³ C08K 5/17

U.S. Cl. 524—239 18 Claims

1. A method for surface treating particles of an interpolymer of ethylene and a polymerizable ethylenically unsaturated monomer containing carboxyl groups, said interpolymer containing up to about 50 weight percent of carboxyl group containing monomer so as to reduce the tendency of such polymer to block and stick, which process comprises contacting such particles with a member selected from the group consisting of

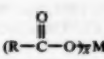
(A) a solution containing from about 0.10 to about 5 weight percent of a tertiary organic amine represented by the formula



wherein R is a hydrocarbon or hydroxyl-substituted hydrocarbon; each Z is independently hydrogen or a monovalent metal selected from group I of the Periodic Table and x has a value equal to the valence of R; and

(B) at least one material or a mixture of materials selected from (1) a solution containing from about 0.1 weight percent of that which provides a saturated solution weight percent of a carboxylic acid having the general formula

wherein R is a hydrocarbon or hydroxyl-substituted hydrocarbon, or p1 (2) a solution containing from about 0.1 weight percent to that which provides a saturated solution weight percent of a carboxylic acid salt represented by the general formula



wherein R is a hydrocarbon or hydroxyl-substituted hydrocarbon; M is a y valent metal selected from Groups I-A or II-A of the Periodic Table; and wherein x = y and each have a value of from 1 to 2 inclusive;

at a temperature of from about 0° C. to about 85° C. for a sufficient time so as to provide the resultant treated particles, after drying, with reduced blocking and/or sticking properties.

4,481,321

PROCESS FOR INCREASING THE OZONE-RESISTANCE OF A RUBBER WITH ENOL ETHERS

Dieter W. Brück, Cologne; Werner Jeblick, Leverkusen, and Lothar Ruetz, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

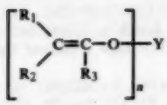
Filed Jul. 22, 1983, Ser. No. 516,047

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228864

Int. Cl.³ C08K 5/17, 5/06

U.S. Cl. 524—243 2 Claims

1. A process for increasing the ozone-resistance of a rubber which comprises incorporating therein an enol ether corresponding to the following general formula:



(I)

wherein

n represents 1 or 2;

R^1, R^2 and R^3, which may be the same or different, represent, C_1–C_{10} alkyl or C_2–C_{10} alkenyl which may be substituted one or more times by chlorine and/or C_1–C_4 alkyl; C_5–C_{20} cyclo- or bicyclo-alkyl or -alkenyl; C_6–C_{10} aryl which may be substituted one or more times by chlorine and/or C_1–C_4 alkyl; or C_6–C_{10} aryl-C_1–C_8 alkyl, the aryl group optionally being substituted one or more times by halogen and/or C_1–C_4 alkyl, additionally R^3 can represent hydrogen;

or pairs of the substituents R_1, R_2 and R_3 may be conjoint provided that, for R_1 and R_2, there is at least one saturated C_4 chain or for R_1 and R_3 or R_2 and R_3 there is at least one C_3 chain; and

when n represents 1, Y represents C_4–C_{12} alkyl or C_4–C_{12}-alkenyl which may contain one or more oxygen atoms or NR_4-groups in the chain instead of —CH_2—, C_5–C_7 cyclo- or bicyclo-alkyl, C_5–C_7-cycloalkenyl, C_5–C_7-bicycloalkenyl, C_6–C_{10} aryl, C_6–C_{10}-aryl- C_1–C_4-alkyl, C_5–C_7-cycloalkyl-C_1–C_4-alkyl, C_5–C_7-cycloalkenyl-C_1–C_4-alkyl or C_5–C_7-bicycloalkenyl-C_1–C_4-alkyl;

when n represents 2, Y represents C_4–C_{12} alkylene which may contain one or more oxygen atoms or NR_4- groups in the chain instead of —CH_2—, C_5–C_7 cycloalkylene, C_6–C_{10}-arylene, xylylene or hexahydroxylylene,

R^4 represents C_1–C_4-alkyl.

4,481,322

NOVEL REINFORCING ADDITIVE AND METHOD OF REINFORCING THERMOPLASTIC POLYMER THEREWITH

Robert E. Godlewski, Mahopac, and Frederick D. Osterholtz, Pleasantville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 30, 1983, Ser. No. 480,498

Int. Cl.³ C08K *5/54*

U.S. Cl. 524—265 **18 Claims**

1. A method of reinforcing a thermoplastic organic polymer which comprises blending said thermoplastic organic polymer with a reinforcing filler mixture comprising of:

(a) from 80 to 99 weight percent, based on the weight of the reinforcing filler mixture, of an inorganic filler;

(b) from 0.05 to 15 weight percent, based on the weight of the reinforcing filler mixture, of a polymerizable unsaturated organic compound having at least two polymerizable unsaturation groups;

(c) from 0.05 to 5 weight percent, based on the weight of the reinforcing filler mixture, of a vinyl-polymerizable unsaturated, hydrolyzable silane;

(d) from 0.05 to 2.5 weight percent, based on the weight of the reinforcing filler mixture, of a surfactant comprising

(i) a siloxane containing at least one silicon-bonded alkyl group having at least 12 carbon atoms; or

(ii) a polyoxyalkylene compound having one or more polyoxyalkylene blocks each bonded at one end to a siloxane block, an alkyl group having at least 12 carbon atoms, or an alkenyl group, and bonded at the other end to an alkoxy group, siloxane block or a hydroxy group; and

(e) from 0.0025 to 2.5 weight percent, based on the weight of the reinforcing filler mixture, of a free radical generator, to form a substantially homogeneous mixture.

4,481,323

HYDROCARBON BLOCK COPOLYMER WITH DISPERSED POLYSILOXANE

Robert E. Sterling, New Port Richey, Fla., assignor to Medical Research Associates, Ltd. #2, Clearwater, Fla.

Continuation-in-part of Ser. No. 147,475, May 7, 1980, Pat. No. 4,386,179. This application May 21, 1981, Ser. No. 266,093

The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.

Int. Cl.³ C08L *25/10, 9/06*

U.S. Cl. 524—269 **25 Claims**

1. A composition of matter comprising a substantially uniform mixture of (A) an elastomeric thermoplastic hydrocarbon block copolymer constituting greater than about 30% of the total weight of said composition and (B) a polysiloxane, said polysiloxane having a viscosity within the range of about 20 to 1,000,000 centistokes at room temperature and constituting about 0.1 to 12 percent of the total weight of said composition, said composition having improved surface properties and processability as a result of the incorporation of said polysiloxane.

4,481,324

POLYGLYCEROL PLASTIC LUBRICANTS

Larry K. Hall, Cogan Station, and Marvin Rosen, Williamsport, both of Pa., assignors to Glyco Inc., Williamsport, Pa.

Filed Feb. 25, 1983, Ser. No. 469,911

Int. Cl.³ C08K *5/10;* **C08L** *9/02, 27/06, 23/12*

U.S. Cl. 524—312 **25 Claims**

1. A rigid lubricated thermoplastic material having incorporated therein, in an amount effective to achieve lubrication of said material when processed, at least one polyglycerol ester of a fatty acid having a degree of polymerization of 2, and having a degree of esterification ranging from 1 to 3, the fatty acid having a carbon chain ranging from C_{12} to C_{20}.

4,481,325

POLYALKYLENELACTONE MODIFIED POLYETHERIMIDES

Harold F. Giles, Jr., Cheshire, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 29, 1983, Ser. No. 566,706

Int. Cl.³ C08L *79/08*

U.S. Cl. 524—320 **9 Claims**

1. A polyalkylenelactone modified polyetherimide comprising a polyetherimide and a flow-modifying amount of polyalkylenelactone having a molecular weight in the range of from about 4,000 to 45,000.

4,481,326

WATER SOLUBLE FILMS OF POLYVINYL ALCOHOL POLYVINYL PYRROLIDONE

Gerard G. Sonenstein, Piscataway, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 414,692, Sep. 3, 1982, abandoned, which is a continuation of Ser. No. 300,315, Sep. 8, 1981, abandoned, which is a continuation of Ser. No. 216,231, Dec. 15, 1980, abandoned. This application Jul. 26, 1983, Ser. No. 517,486

Int. Cl.³ C08L *29/04, 39/06*

U.S. Cl. 524—377 **6 Claims**

1. A water soluble coherent self-supporting film comprising a uniform mixture of water soluble polyvinyl alcohol, namely 79–95% hydrolyzed polyvinylacetate, and polyvinyl pyrrolidone wherein both of said polymers have weight average molecular weights in the range of about 10,000 to 50,000, the weight ratio of polyvinyl alcohol to polyvinyl pyrrolidone being in the range of from 10:1 to about 1:1.

4,481,327
RUBBER COMPOSITIONS COMPRISINING AN ALKADIENE SULFONE AN CARBON BLACK

Masaki Ogawa; Yasushi Hirata, both of Sayama, and Akira Tsuchikura, Tokyo, all of Japan, assignors to Bridgestone Tire Company, Ltd., Tokyo, Japan

Filed Dec. 29, 1982, Ser. No. 454,292

Claims priority, application Japan, Jan. 19, 1982, 57-5441

Int. Cl.³ C08K *3/04, 5/41;* **B60C** *3/00, 5/08*

U.S. Cl. 524—432 **2 Claims**

1. A pneumatic tire in which the tread rubber and the sidewall rubber are formed of a rubber composition comprising:

(a) 100 parts by weight of at least one rubber selected from the group consisting of natural rubber and dienic synthetic rubbers;

(b) 20–70 parts by weight of carbon black; and

(c) not greater than 1.5 parts by weight of alkadiene sulfone, wherein the amount of said alkadiene sulfone based on said carbon black is 0.4–4% by weight.

4,481,328
PULVERULENT POLYMER COMPOSITION, A PROCESS FOR ITS PREPARATION AND ADHESIVE BASED THEREON

Albrecht Harréus; Eduard Kaiser; Detlev Seip, and Wolfgang Zimmermann, all of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,756

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101413

Int. Cl.³ C08J *3/12, 5/02;* **C08K** *3/36;* **C08L** *31/04*

U.S. Cl. 524—493 **10 Claims**

1. A pulverulent polymer composition obtained by spray drying of an aqueous polymer dispersion in the presence of a hydrophobic silica comprising 98.0 to 99.9 percent by weight of a water-dispersible vinyl ester polymer and 2.0 to 0.1 percent by weight of a hydrophobic silica, said vinyl ester polymer being a homopolymer of a vinyl ester having four, five or six carbon atoms or said vinyl ester polymer being a vinyl ester copolymer comprising a copolymer of vinyl acetate and a vinyl ester of a carboxylic acid having three to eighteen carbon atoms, a vinyl chloride or an ethylene.

7. A process for the preparation of a pulverulent, silica-containing polymer composition based on a water-dispersible vinyl ester polymer, which comprises spray drying an aqueous vinyl ester polymer dispersion having a solids content of 30 to 60 percent by weight, said vinyl ester polymer being a homopolymer of a vinyl ester having four, five or six carbon atoms or said vinyl ester polymer being a vinyl ester copolymer comprising a copolymer of vinyl acetate and a vinyl ester of a carboxylic acid having three to eighteen carbon atoms, a vinyl chloride or an ethylene, in the presence of a hydrophobic silica in a quantity of 0.1 to 2.0 percent by weight.

4,481,329
METHOD OF DISPERSING REINFORCING PIGMENTS IN A LATEX

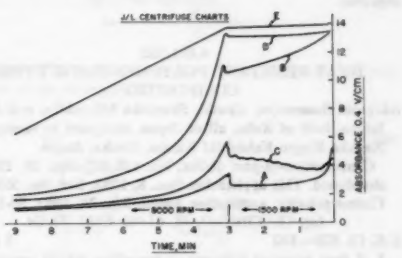
Michael R. Ambler, Stow, and Gary L. Burroway, Doylestown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 21, 1983, Ser. No. 544,304

Int. Cl.³ C08J *3/02*

U.S. Cl. 524—501 **8 Claims**

1. A process for blending rubber latex and a reinforcing agent by stirring and dispersing a mixture of the reinforcing agent selected from the group consisting essentially of carbon black and precipitated hydrated amorphous silicas in the rubber latex, the improvement comprising initially contacting the reinforcing agent with a 60/40 to 40/60 butadiene/methacrylic acid dispersing latex which has been converted to a water soluble form through treatment with an alkali metal hydroxide



at a ratio of dry reinforcing agent to dispersing latex solids in the range of from 90:10 to 99:1.

4,481,330
POLYCARBONATE RESIN COMPOSITION

Osamu Ohara, and Kazuo Kishimoto, both of Matsuyama, Japan, assignors to Teijin Chemicals, Ltd., Tokyo, Japan

Filed Dec. 7, 1982, Ser. No. 447,671

Claims priority, application Japan, Dec. 8, 1981, 56-196256; Dec. 8, 1981, 56-196257; May 18, 1982, 57-82404

Int. Cl.³ C08L *69/00*

U.S. Cl. 525—67 **12 Claims**

1. A polycarbonate resin composition comprising

(A) 20 to 90% by weight of a polycarbonate resin,

(B) 5 to 70% by weight of an aromatic polyester resin,

(C) 1 to 15% by weight of an isobutylene copolymer rubber composed of a major proportion of isobutylene and a minor proportion of isoprene,

(D) 1 to 20% by weight of an elastomeric acrylic graft copolymer resin composed of, as a trunk polymer, a crosslinked acrylic copolymer containing not less than 3% by weight of butadiene as a comonomer and being free from ethylene and grafted thereto, at least one grafting monomer selected from the group consisting of styrene, alkyl acrylates and alkyl methacrylates, and

(E) 0 to 15% by weight of an olefin resin derived from an olefin having 2 to 6 carbon atoms; wherein the weight ratio of [resin (A)+resin (B)]/[rubber (C)+resin (D)] is from 2 to 20, and when the resin (E) is present, the weight ratio of resin (B)/[rubber (C)+resin (D)+resin (E)] is from 1 to 5.

4,481,331
POLYCARBONATE RESIN MIXTURE

Ping Y. Liu, 124 Tanager Ct., Naperville, Ill. 60565

Filed Mar. 22, 1983, Ser. No. 477,739

Int. Cl.³ C08L *53/00*

U.S. Cl. 525—92 **26 Claims**

1. A resin mixture comprising:

(a) an aromatic polycarbonate resin; and

(b) a modifier combination therefor comprising

(i) a selectively hydrogenated linear, sequential, or radial teleblock copolymer resin of a vinyl aromatic compound $(A)_n$ and $(A')_n$ and an olefinic elastomer (B), of the A-B-A'; A-(B-A-B)$_n$-A; A(BA)$_n$B; $(A)_4B$; $B(A)_4$; or $B((AB)_nB)_4$ type, wherein n is an integer of from 1 to 10;

(ii) a copolymer of an olefin and at least one of a C_1–C_6 alkyl acrylate, a C_1–C_6 alkyl methacrylate acrylic acid, methacrylic acid, or mixtures of any of the foregoing,

said modifier being present in said mixture in an amount at least sufficient to impart to said mixture a resistance to environmental stress crazing and cracking greater than that possessed by said polycarbonate resin wherein (a) comprises from about 50 to 96 parts by weight of (a) and (b) together and (b)(i) com-

prises from about 2 to 25 parts by weight and (b)(ii) is from about 2 to 25 parts by weight, per parts by weight of (a) and (b) together.

4,481,332

HEAT RESISTANT POLYPHENYLENE ETHER COMPOSITION

Akiyoshi Somemiya, Akashi; Shunichu Miyashita, and Junichi Ishizu, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

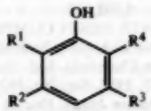
Continuation-in-part of Ser. No. 425,697, Sep. 28, 1982, abandoned. This application Dec. 8, 1983, Ser. No. 559,266

Claims priority, application Japan, Sep. 28, 1981, 56-154515

Int. Cl.³ C08G *65/44, 65/40;* **C08L** *71/04*

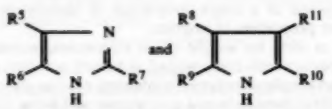
U.S. Cl. 525—132 **8 Claims**

1. A heat resistant polymer composition which comprises a blend consisting essentially of (a) 1 to 99% by weight of a polyphenylene oxide copolymer prepared by oxidative coupling polymerization of a phenol compound having the general formula (1);



(1)

wherein R^1, R^2, R^3 and R^4 are hydrogen, a hydrocarbon group or a substituted hydrocarbon group,
and at least one member selected from the group consisting of nitrogen-containing compounds having the general formulas (2) and (3):



(2) (3)

wherein R^5 to R^{11} are hydrogen, a hydrocarbon group or a substituted hydrocarbon group, provided that two adjacent groups, R^5 and R^6, R^8 and R^9, and R^{10} and R^{11} can be joined to form a substituted or nonsubstituted aromatic ring,
(b) 99 to 1% by weight of a polymer prepared by radical polymerization of one or more kinds of monomers having at least one vinyl group in the molecule.

4. The composition of claim 1, wherein the polymer (b) is a homopolymer or copolymer of a styrene compound.

5. The composition of claim 1, wherein the polymer (b) is a homopolymer or copolymer of an acrylate.

4,481,333

THERMOPLASTIC COMPOSITIONS COMPRISING VINYL CHLORIDE POLYMER, CLPE AND FLUOROPOLYMER

Dietrich Fleischer, Darmstadt; Eckhard Weber, Liederbach, and Johannes Brandrup, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 28, 1983, Ser. No. 566,207

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1982, 3248731

Int. Cl.³ C08L *23/28, 27/06, 27/18*

U.S. Cl. 525—192 **7 Claims**

1. A thermoplastic composition consisting essentially of (A) 97 to 80% by weight of a vinyl chloride polymer and (B) 3 to 20% by weight of a chlorinated low-pressure polyethylene, wherein, before the components (A) and (B) are mixed, the component (B) is mixed with 0.01 to 2.0% by weight, relative to the chlorinated low-pressure polyethylene, of a finely divided fluoropolymer.

4,481,334

COMPOSITION FOR DRAWN FILM, COLD DRAWN FILM MADE OF SAID COMPOSITION AND PROCESS FOR MANUFACTURE OF SAID FILM

Isao Yoshimura, Fujisawa; Hideo Hata, and Takashi Kaneko, both of Yokohama, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Division of Ser. No. 213,461, Dec. 5, 1980, which is a division of Ser. No. 949,253, Oct. 6, 1978, Pat. No. 4,277,578. This application Jan. 12, 1983, Ser. No. 457,363

Claims priority, application Japan, Oct. 11, 1977, 52-120917; Nov. 22, 1977, 52-139431; May 30, 1978, 53-63870; May 30, 1978, 53-63872

Int. Cl.³ C08L *23/08, 23/12, 23/20, 23/16*

U.S. Cl. 525—211 **10 Claims**

1. A composition comprising a homogeneous blend of one of the specific combinations of components, namely the combination of (A)+(B)+(C); wherein

(A) is at least one selected from the group consisting of copolymers of ethylene with vinyl ester monomers, unsaturated aliphatic monocarboxylic acids and alkyl esters of said acids which are all copolymerizable with ethylene,

(B) is an elastomer having a density of not more than 0.91 g/cm³ and made of an ethylene-α-olefin copolymer, and

(C) is composed of crystalline polypropylene and crystalline polybutene-1 and the ratios of the components are such as to satisfy $0.05 \leqq B/(A+B) \leqq 0.90$ and $0.05 \leqq B/(A+B) \leqq 1.20$.

4,481,335

RUBBER COMPOSITIONS AND METHOD

Fred J. Stark, Jr., 4507 Willow Oak La., Minnetonka, Minn. 55343

Filed Aug. 10, 1981, Ser. No. 291,386

Int. Cl.³ C08J *11/04;* **C08L** *9/00, 9/02, 9/06*

U.S. Cl. 525—261 **18 Claims**

1. A substantially dry, particulate molding material comprising a uniform mixture of

(a) 100 parts by weight of cured rubber particles;

(b) from about 1 to about 5 parts by weight of liquid, sulfur-curable polymeric binder having ethylenic unsaturation and being soluble in hexane, benzene or a combination thereof, the binder having a viscosity at 280° F. of not greater than about one million centipoises and further characterized as being capable of softening surfaces of the cured rubber particles when applied thereto and the particles are heated; and

(c) a curing agent for the polymeric binder in a quantity ranging from about 50% to about 500% by weight of the polymeric binder.

8. A method of producing a rubber-like article comprising the steps of

(a) uniformly and thoroughly mixing together

(i) 100 parts by weight of particulate, cured rubber;

(ii) from about 1 to about 5 parts by weight of a liquid, sulfur-curable polymeric binder having ethylenic unsaturation and being soluble in hexane, benzene, or a combination thereof, the binder having a viscosity at 280° F. of not greater than about one million centipoises and further characterized of being capable as softening sufaces of the cured rubber particles when applied thereto and the particles are heated; and

(iii) a curing agent for the polymeric binder in a quantity ranging from about 50% to about 500% by weight of the polymeric binder;

(b) charging the composition as a substantially dry, free-flowing, particulate mass, to a compression mold; and

(c) molding the composition under heat and pressure to form a solid, strong molded article.

4,481,336

OLEFINIC BLOCK COPOLYMERS OF ETHYLENE PROPYLENE AND 1-BUTENE

Masaki Fujii, and Mitsutaka Miyabayashi, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,838
Claims priority, application Japan, Mar. 23, 1982, 57-45800
Int. Cl.³ C08F *297/08*
U.S. Cl. 525—323 5 Claims

1. An olefinic block copolymer characterized by being defined by the following conditions (1) and (2):

(1) the MFR (ASTM-D-1238) (L)) of said olefinic block copolymer is in the range of from 0.01–200 g/10 min.; and

(2) said block copolymer comprises 60–95 parts by weight of a ternary random copolymer (A) comprising 85–94.2% by weight of propylene, 0.8–4% by weight of ethylene and 5–15% by weight of butene-1, and 5–40 parts by weight of a binary or ternary random copolymer block (B) comprising 30–90% by weight of butene-1, 10–70% by weight of propylene and 0–0.5% by weight of ethylene.

4,481,337

PROCESS FOR THE PREPARATION OF MODIFIED POLYMERS

Donald J. Burlett, Akron, and Dane K. Parker, Massillon, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 19, 1983, Ser. No. 533,717
Int. Cl.³ C08F *114/02*
U.S. Cl. 525—340 17 Claims

1. A process for the modification of a polymer having pendant halo-benzyl groups comprising

(a) combining said polymer with a quaternary ammonium or phosphonium salt as a catalyst and an alkaline ionizable molecule containing antidegradant properties thereafter

(b) combining the resultant mixture with an alkaline compound at a reaction temperature of from 10° to 120° C. and in the presence of a nitrogen atmosphere to yield said modified polymer having covalently bonded antidegradant functionality.

4,481,338

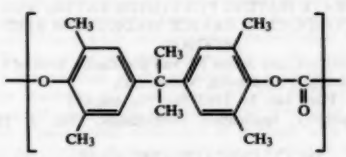
FLAME-RESISTANT POLYMER MIXTURES

Volker Serini; Werner Nouvertné, and Dieter Freitag, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,171
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233617
Int. Cl.³ C08K *3/40*; C08L *21/18, 69/00, 87/00*
U.S. Cl. 525—394 7 Claims

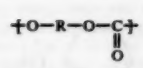
1. Flame-resistant polymer mixtures, characterized in that they contain

(a) from 25 to 99.5% by weight of a polycarbonate having a weight average molecular weight of from 10,000 to 200,000 and comprises the linear chains of at least 85 mol % of recurring structural units corresponding to formula (1):



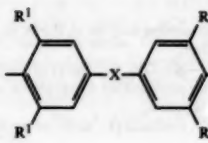
(1)

and at most 15 mol % of recurring units corresponding to formula (2):



(2)

wherein —R— represents an o-, m- or p-phenyl radical or a radical of the formula (2a)

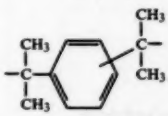


(2a)

in which

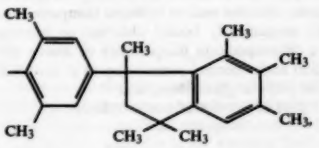
R^1 represents hydrogen, halogen, or C_1–C_3-alkyl and

X represents a C_1–C_5-alkylene- or alkylidene radical, a C_3–C_6-cycloalkylene- or cycloalkylidene-radical, a single bond, —S— or a radical of the formula (2b)



(2b)

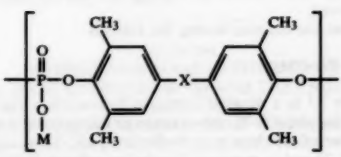
or a radical of the formula (2c)



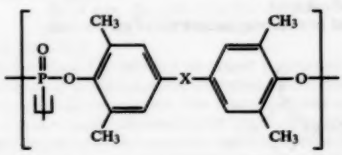
(2c)

in which the two alkyl substituents may be in o-, m- or p-position to each other, with the proviso that units of formula (1) are not comprised;

(b) from 0.5 to 75% by weight of a branched polyphosphate having a glass transition temperature from below 20° C. to above 70° C. and apparent molecular weights of from 1,600 to 150,000 which has at least 1 mol % of recurring structural units corresponding to the formulae (3) and/or (4):

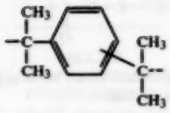


(3)



(4)

wherein X represents a C_1–C_5 alkylene or alkylidene radical, a C_5–C_6 cycloalkylene or cycloalkylidene radical, a single bond, —S— or



wherein

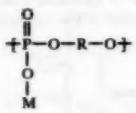
the two i-propylidene groups may be in the o, m, p-position relative to each other,

M represents H, Y or —R—OH, and the H of the OH groups may be at least partly replaced by metal atoms which form ionogenic groups, wherein

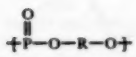
Y represents an alkyl-, cycloalkyl-, aryl- or arylkyl-radical and

R is as defined above,

and at most 99 mol % of recurring structural units corresponding to formulae (5) and/or (6):



(5)



(6)

wherein R and M are as defined above,

(c) from 0 to 20 parts per hundred (all parts by weight) of one or more organic chlorine and/or bromine compounds which contain only aromatically bound chlorine or bromine or both, have a decomposition temperature of above 250° C. and do not boil under normal pressure up to at least 300° C.,

(d) from 0 to 20 parts of glass fibres, and

(e) from 0 to 1 part of polytetrafluoroethylene.

4,481,339

ACID-EXTENDED COPOLYAMIDEIMIDES AND METHOD FOR THEIR PREPARATION

Donald A. Bolon, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1983, Ser. No. 532,326

Int. Cl.³ C08G 73/14

U.S. Cl. 525—424 **19 Claims**

1. A method for preparing an acid-extended copolyamideimide which comprises the steps of:

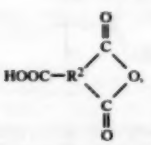
(1) reacting, under conditions whereby all water of reaction is removed:

(A) at least one diamine having the formula

$$H_2N—R^1—NH_2, \quad (I)$$

wherein R^1 is a divalent aromatic hydrocarbon radical containing about 6–20 carbon atoms or halogenated derivative thereof, alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or bis-alkylenepoly(dialkylsiloxane) radical; with

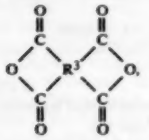
(B) at least one carboxy anhydride of the formula



(II)

wherein R^2 is a trivalent aliphatic radical containing about 2–20 carbon atoms or aromatic radical containing about 6–20 carbon atoms, and

(C) at least one dianhydride of the formula



(III)

wherein R^3 is a tetravalent aliphatic radical containing about 2–20 carbon atoms or aromatic radical containing about 6–20 carbon atoms;

the molar ratio of reagent C to reagent B being at least about 0.25:1 and the ratio of equivalents of reagent A to anhydride equivalents of reagents B and C combined being about 1:1; and subsequently

(2) reacting, at a temperature within the range of about 150°–225° C., a mixture of

(D) the product of step 1, or a functional derivative thereof, and

(F) at least one dicarboxylic acid having the formula

$$HOOC—R^7—COOH, \quad (IV)$$

wherein R^7 is a divalent alkylene or aromatic hydrocarbon radical containing about 3–12 carbon atoms, or a functional derivative thereof; the molar ratio of reagent F to reagent D being about 0.1–2:1; with

(E) at least one compound selected from the group consisting of diisocyanates having the formula

$$OCN—R^4—NCO \quad (IV)$$

and diamines having the formula

$$R^5NH—R^4—NHR^6, \quad (V)$$

wherein

R^4 is a divalent polymeric radical, aromatic hydrocarbon radical containing about 6–20 carbon atoms or halogenated derivative thereof, alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or bis-alkylenepoly(dialkylsiloxane) radical; and

each of R^5 and R^6 is independently hydrogen or a lower hydrocarbon radical.

4,481,340

PHOTOSENSITIVE POLYAMIC ACID DERIVATIVE, COMPOUND USED IN MANUFACTURE OF DERIVATIVE, METHOD OF MANUFACTURING SUBSTRATE HAVING POLYIMIDE LAYER, AND SEMICONDUCTOR DEVICE MADE FROM SAID METHOD

Lourens Minnema, and Johan M. van der Zande, both of Groenewoudseweg 1, Eindhoven, Netherlands

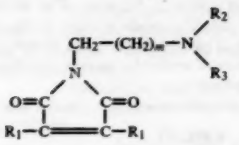
Filed Jan. 24, 1983, Ser. No. 460,415

Claims priority, application Netherlands, Dec. 3, 1982, 8204688

Int. Cl.³ G03C 1/70; C08G 69/48

U.S. Cl. 525—426 **2 Claims**

1. A photosensitive polyamic acid derivative obtained by treating a polyamic acid with a compound of the formula



(I)

wherein R_2 and R_3 are equal or different and represent a hydrogen atom or an alkyl group having 1–4 carbon atoms, R_1 is an alkyl group having 1–4 carbon atoms, and m has the value 0–3.

4,481,341

THERMOSETTING ORGANOPOLYSILOXANE MIXTURES CONTAINING PLATINUM CATALYST DISPERSED IN SOLID SILICONE RESIN

Ottfried Schlak, Leverkusen; Werner Michel, Cologne, and Bernard Munchenbach, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 2, 1982, Ser. No. 404,289

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131734

Int. Cl.³ C08L *83/06*

U.S. Cl. 525—478 **5 Claims**

1. Thermosetting organopolysiloxane mixtures, with good storage stability at room temperature, which are settable by addition of a silicon bonded hydrogen to an unsaturated carbon to carbon bond, said mixture containing

at least one organopolysiloxane having in each molecule at least two unsaturated monovalent hydrocarbon moieties bonded to the silicon atom,

at least one organohydrogenpolysiloxane having in each molecule at least two hydrogen atoms bonded to the silicon atom, and

a catalyst amount of platinum or a platinum compound finely dispersed in a solid silicone resin at a concentration of 0.01–5%, by weight calculated as platinum metal and based on the total weight of catalyst and solid resin, wherein the solid platinum-containing catalyst material has a melting point or softening point between 70° and 250° C., is practically imiscible with the organopolysiloxane and organohydrogenpolysiloxane mixture below the melting point or the softening point, and is finely dispersible therein.

4,481,342

METHOD OF PREPARING LOW-DENSITY ETHYLENE COPOLYMERS

Renzo Invernizzi, Milan, and Ferdinando Ligorati, Usmate, both, Italy, assignors to Anic S.p.A., Palermo, Italy

Filed May 26, 1983, Ser. No. 498,370

Claims priority, application Italy, Jun. 10, 1982, 21805 A/82

Int. Cl.³ C08F *4/02, 210/02*

U.S. Cl. 526—125 **7 Claims**

1. Method for preparing copolymers of ethylene and alpha-olefins, with densities of from 0.915 to 0.942 g/ml characterized by polymerizing ethylene and an alpha-olefin having from 4 to 8 carbon atoms in an inert (unreactive) organic liquid medium at a temperature of from 50° to 70° C. and at a pressure less than 10 bars, while maintaining a concentration of from 5 to 25% by wt. of the said alpha-olefin in the said medium during the reaction, in the presence of a Ziegler supported catalyst consisting of a compound selected from alkylaluminums and alkylaluminum halides and the product of the reaction of a halogenated derivative of titanium with the solid spheroidal product of the spray drying of a solution of magnesium chloride in ethanol containing at least one additional compound with a boiling point higher than that of ethanol at atmospheric pressure selected from the group consisting of aliphatic, cycloaliphatic or aromatic liquid hydrocarbons or polar organic hydroxy compounds, said solid, spheroidal product of the spray drying having a residual alcoholic hydroxyl group content of from 1.5% to 20% by wt., a surface area of from 10 to 100 m^2/g and a porosity of from 1.2 to 3.5 ml/g with a pore radius of from 1,000 to 65,000 Angstroms.

4,481,343

PROCESS FOR THE POLYMERIZATION OF TETRAFLUOROETHYLENE IN AQUEOUS DISPERSION

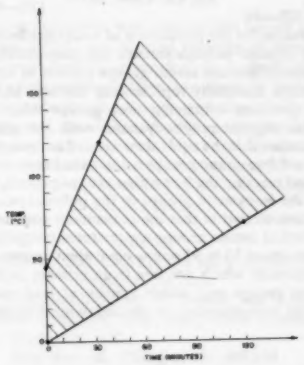
Jean-Louis Herisson, Brignais, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Nov. 12, 1980, Ser. No. 205,993

Claims priority, application France, Dec. 21, 1979, 79 31395

Int. Cl.³ C08F *114/26*

U.S. Cl. 526—255 **8 Claims**



1. The process for the preparation of a polytetrafluoroethylene comprising polymerizing a tetrafluoroethylene in aqueous dispersion in the presence of an emulsifier and an initiator, and without a stabilizer, with the latter yielding free radicals between 0° and 45° C. and being destroyed for a temperature above 45° C., while regulating the temperature of the reaction medium as a function of polymerization time to follow an ascending curve, Temperature °C. versus t (time in minutes), whose slope $\Delta T/\Delta t$ cannot be less than 1/6, ΔT representing the temperature in °C. at a given time in minutes Δt, with this ascending curve being situated inside of a sector limited by two straight lines $y=7/12x$ and $y=15/7x+45$, in which y and x respectively represent the temperature in °C. and the time expressed in minutes; the initial polymerization temperature being between about 0° and 45° C.

4,481,344

METHOD FOR MAKING THERMOSET POLY(DICYCLOPENTADIENE) AND THE PRODUCT SO PRODUCED

Norman R. Newburg, deceased, late of Wilmington, Del. (by Betty Newburg, executrix), assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 26, 1983, Ser. No. 526,836

Int. Cl.³ C08F *32/06*

U.S. Cl. 526—283 **4 Claims**

1. In a method for making a thermoset polymer of polymerized units of dicyclopentadiene comprising: first, combining a plurality of reactant streams, one reactant stream containing the activator of a metathesis-catalyst system, a second reactant stream containing a catalyst of said metathesis-catalyst system, and of at least one reactant stream containing dicyclopentadiene, the improvement of adding to at least one reactant stream a halogen containing hydrocarbyl additive where the halogen containing hydrocarbyl additive contains at least one

trihalogen substituted carbon atom or at least one activated halogen atom.

4,481,345

PROCESS FOR THE PRODUCTION OF COMBINATIONS OF ORGANIC POLYISOCYANATES AND AT LEAST PARTLY BLOCKED POLYAMINES, THE COMBINATIONS OBTAINABLE BY THIS PROCESS AND THEIR USE FOR THE PRODUCTION OF LACQUERS, COATING OR SEALING COMPOSITIONS

Klaus Nachtkamp, Cologne; Manfred Bock, Leverkusen; Reinhard Halpaap, and Josef Pedain, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,918

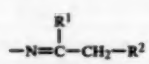
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308418

Int. Cl.³ C08G *18/38*

U.S. Cl. 528—59 **10 Claims**

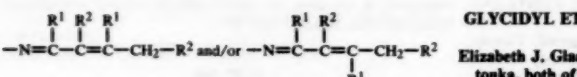
1. A process for the production of water-hardenable compositions of organic polyisocyanates and polyamines containing at least partly blocked amino groups present as ketimines, the compositions essentially representing mixtures and optionally reaction products containing urea groups which comprises mixing the organic polyisocyanates with the polyamines in such quantities that the equivalent ratio of isocyanate groups to blocked and free amino groups amounts to between about 0.9:1 and 4:1 and reacting the free amino groups present, if any, with some of the isocyanate groups in the polyisocyanate to form ureas, characterized in that the polyamines containing at least partly blocked amino groups are mixtures comprising

(a) from about 50 to 95 amine equivalent percent of organic compounds which are free from primary and secondary amino groups and which contain at least two ketimine groups corresponding to the following formula



in which R^1 represents an alkyl or cycloalkyl radical and R^2 represents hydrogen or an alkyl or cycloalkyl radical or in which R^1 and R^2 form a cycloaliphatic hydrocarbon radical together with the two carbon atoms of the ketimine group and

(b) from about 5 to 40 amine equivalent percent of organic compounds which are free from primary and secondary amino groups and which contain at least two ketimine groups of which one corresponds to the following formula



in which R^1 and R^2 are as defined above, and the remaining ketimine group(s) correspond(s) to the formula shown in (a).

4,481,346

METHOD OF PRODUCING POLYMERS OF THE POLYURETHANE TYPE

Zygmunt Wirpsza, Warsaw, and Krzysztof Kowalski, Chelm, both of Poland, assignors to Wyzsza Szkola Inzynierska Im. Kazimierza Pulaskiego, Malczewskiego, Poland

Filed Jul. 5, 1983, Ser. No. 510,831

Claims priority, application Poland, Jul. 20, 1982, 237606

Int. Cl.³ C08G *18/00*

U.S. Cl. 528—73 **10 Claims**

1. A method of producing polymers of the polyurethane type comprising amidating oligoesterols or oligoetherols by reacting them with isocyanic acid and condensing the amide compounds thus obtained with 0.25–5.0 mole of an aldehyde per gram-equivalent of primary amide groups in the compounds and in a medium of pH not higher than 10 for a time sufficient to form a polymer of molecular mass bigger that that of the initial amide compound.

4,481,347

EPOXY RESINS CONTAINING PHOSPHORUS

James L. Bertram, and William Davis, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1983, Ser. No. 544,044

Int. Cl.³ C08G *59/40*

U.S. Cl. 528—102 **13 Claims**

1. An epoxy resin composition prepared by reacting in the presence of a catalytic quantity of a suitable catalyst

(A) at least one epoxy resin having an average of more than one vicinal epoxy group per molecule,

(B) at least one phosphoramide represented by the formula

wherein each R is independently hydrogen or a hydrocarbyl or an inertly substituted hydrocarbyl group having from 1 to about 20 carbon atoms; and

(C) at least one compound having an average of more than one aromatic hydroxyl group per molecule; and wherein the components are employed in a quantity which provides an epoxy group to total number of hydrogen atoms attached to a nitrogen atom and/or an oxygen atom ratio of from about 2.25:1 to about 10:1, and components (B) and (C) are employed in a quantity which provides a ratio of hydrogen atoms attached to a nitrogen atom to hydrogen atoms attached to an oxygen atom of from about 0.1:1 to about 10:1, and with the proviso that at least one of components (A) or (C) has an average functionality of not greater than about 2 and when the other component (A) or (C) has a functionality greater than about 2, it is present only in quantities which do not cause the resultant composition to become gelled.

4,481,348

GLYCIDYL ETHER OF GEM-BIS(HYDROXYMETHYL) HYDROCARBONS

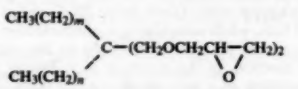
Elizabeth J. Gladfelter, St. Paul, and Edgar R. Rogier, Minnetonka, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 321,961, Nov. 16, 1981, abandoned. This application Jan. 24, 1983, Ser. No. 460,341

Int. Cl.³ G08G *59/22*

U.S. Cl. 528—103 **10 Claims**

1. A diglycidyl ether of the formula



wherein m has a value of from 1 to 4 and n has a value of from 1 to 5.

10. The composition of claim 1 wherein the diglycidyl ether is present at from about 5% to 50% of the total glycidyl content of an epoxy resin composition.

4,481,349

HARDENER FOR EPOXY RESINS AND PROCESS FOR HARDENING EPOXY RESINS

Manfred Marten, and Wilhelm Becker, both of Hamburg, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 8, 1983, Ser. No. 530,220

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233565

Int. Cl.³ C08G 59/50

U.S. Cl. 528—120 13 Claims

1. A hardener composition for epoxy resins comprising

(a) an araliphatic or cycloaliphatic diamine having 4 amino hydrogen atoms or a derivative thereof having at least 3 amino hydrogen atoms, said diamine or derivative thereof being liquid at room temperature, together with

(b) 0.1 to 10 percent by weight of a primary aliphatic monoamine having 5 to 18 carbon atoms, the percentage being referred to the total amount of diamine, its derivative and monoamine.

9. A process for hardening an epoxy resin which is liquid by itself or dissolved in a solvent, with a hardener composition for epoxy resins comprising

(a) an araliphatic or cycloaliphatic diamine having 4 amino hydrogen atoms or a derivative thereof having at least 3 amino hydrogen atoms, said diamine or derivative thereof being liquid at room temperature, together with

(b) 0.1 to 10 percent by weight of a primary aliphatic monoamine having 5 to 18 carbon atoms, the percentage being referred to the total amount of diamine, its derivative and monoamine.

4,481,350

PROCESS FOR THE PREPARATION OF THERMOPLASTIC AROMATIC POLYPHOSPHONATES CONTAINING SMALL PROPORTIONS OF CARBONATE STRUCTURES AND PRODUCT THEREOF

Manfred Schmidt; Ludwig Bottenbruch, and Dieter Freitag, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

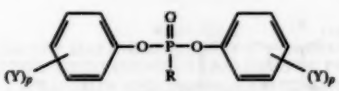
Continuation of Ser. No. 360,069, Mar. 22, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 595,461

Int. Cl.³ C08G 79/04

U.S. Cl. 528—167 10 Claims

1. The process for preparation of a polyphosphonate polymer having from 0.3 to 4.5 mole percent carbonate moieties, on a molar basis relative to the molar sum of phosphonate and carbonate moieties, comprising the steps of

(a) reacting a diphenol with a diaryl phosphonate of the formula



in a molar ratio of 1.03 to 0.97 in the presence of a neutral transesterification catalyst at temperatures of 230° to 320° C.,

wherein R is selected from the group consisting of alkyl having 1–12 carbon atoms, alkenyl having 2–12 carbon atoms, cycloalkyl having 6–30 carbon atoms, cycloalkenyl having 6–30 carbon atoms, aryl having 6–30 carbon atoms, arylalkyl having 7–30 carbon atoms and arylalkenyl having 8–30 carbon atoms with aryl moieties being unsubstituted or substituted by at least one of alkyl having 1–4 carbon atoms or halogen;

Y is alkyl having 1–4 carbon atoms or halogen;

P is zero or an integer from 1 to 5;

(b) simultaneously removing volatile monohydroxyaryl compounds produced in the reaction by distillation at a pressure falling from 500 to not less than 2 mbars over a period of 1.5 to 2.5 hours; and

(c) then completing the reaction by adding 0.5 to 8.5 mole percent of a diaryl carbonate on a molar basis relative to the sum in moles of diaryl phosphonate and diaryl carbonate reactants and continuing to remove volatile monohydroxyaryl compound by distillation at 250° to 320° C. for 1 to 2 hours at a pressure falling from 300 to not less than 0.2 mbar.

4,481,351

BRANCHED POLYESTER WAXES

Richard L. McConnell; Frederick B. Joyner, and Jimmy R. Trotter, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,558

Int. Cl.³ C08G 63/02

U.S. Cl. 528—272 9 Claims

1. A branched polyester wax composition having a melting point less than 200° C., an inherent viscosity of about 0.05 to about 0.39, a melt viscosity of about 10 cp. to about 2000 cp. at 190° C., and a heat of fusion of less than 26 cal./g. derived from aliphatic and cycloaliphatic diacids, and the acid functioning derivatives thereof, about 98 to 70 mole percent linear aliphatic and cycloaliphatic glycols having 2 to 10 carbon atoms as the diol member, and about 2 to 30 mole percent of a member selected from the group consisting of triols and tetraols.

4,481,352

POLYESTER WAXES BASED ON MIXED ALIPHATIC DIBASIC ACIDS

Richard L. McConnell; Jimmy R. Trotter, and Frederick B. Joyner, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,533

Int. Cl.³ C08G 63/16

U.S. Cl. 528—302 23 Claims

1. A normally solid linear copolyester wax composition having a melting point less than 200° C., heat of fusion of less than 7 cal/g, an inherent viscosity from about 0.05 to about 0.4 and a melt viscosity of about 150 cp. to about 2000 cp. at 215° C. containing about 95 to about 50 mole percent of at least one aromatic dicarboxylic acid member selected from the group consisting of aromatic dicarboxylic acids and the acid functioning derivatives thereof, about 5 to about 50 mole percent of a mixture of aliphatic dicarboxylic acid members containing from 4 to 12 carbon atoms and the acid functioning derivatives thereof, about 95 to about 60 mole percent of ethylene glycol and about 5 to about 40 mole percent of diethylene glycol.

4,481,353

BIORESORBABLE POLYESTERS AND POLYESTER COMPOSITES

Emery Nyilas, Austin, Tex., and Tin-Ho Chiu, Reading, Mass., assignors to The Children's Medical Center Corporation, Boston, Mass.

Filed Oct. 7, 1983, Ser. No. 539,978

Int. Cl.³ C08G 63/52

U.S. Cl. 528—303 22 Claims

1. A bioresorbable polyester in which monomeric subunits are arranged randomly in the polyester molecules, said polyester comprising the condensation reaction product of

a Krebs Cycle dicarboxylic acid or isomer or anhydride thereof, chosen for the group consisting of succinic acid, fumaric acid, oxaloacetic acid, L-malic acid, and D-malic acid,

a diol having 2, 4, 6, or 8 carbon atoms, and

an alpha-hydroxy carboxylic acid chosen from the group consisting of glycolic acid, L-lactic acid and D-lactic acid.

4,481,354
PROCESS AND COMPOSITION FOR LOWERING THE REVERSIBLE PHASE CHANGE TEMPERATURE OF NYLON COMPOSITIONS

Benedict S. Curatolo, Maple Heights, and Gerald P. Coffey, Lyndhurst, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

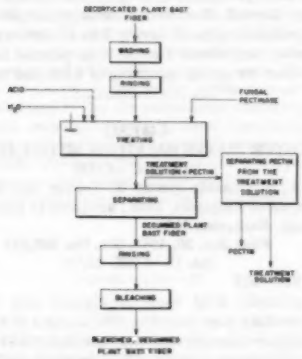
Filed Dec. 20, 1982, Ser. No. 451,194
Int. Cl.³ C08G *69/46*
U.S. Cl. 528—487 **17 Claims**

1. A process for modifying nylon composition to provide compositions having reversible recrystallization at a lower melting point comprising: contacting a nylon composition or mixtures thereof with a lithium halide and an organic sulfone.

4,481,355
METHOD FOR DEGUMMING DECORTICATED PLANT BAST FIBER

Michael C. Jaskowski, Pittsburgh, Pa., assignor to Helmic, Inc., Pittsburgh, Pa.

Filed Nov. 22, 1983, Ser. No. 554,256
Int. Cl.³ C13L *1/00*; D21C *3/00*; D01C *1/04*
U.S. Cl. 536—2 **26 Claims**



1. A method for degumming decorticated plant bast fiber to remove pectin-containing material therefrom comprising the steps of,

washing the decorticated plant bast fiber with a washing solution containing a surface active agent to penetrate said plant bast fiber to remove water soluble material therefrom,

rinsing the washed plant bast fiber, and

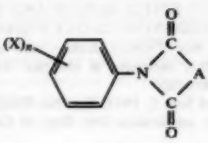
treating the washed and rinsed plant bast fiber with an aqueous, acidic treatment solution of fungal pectinase for a period of time up to about one hour to degum the plant bast fiber, said solution being maintained at an elevated temperature and having a pH between about 2.0 and about 4.5.

4,481,356
DIENE ADDUCTS WITH TRIAZOLINE DIONES

Terry J. Gilbertson, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 174,050, Jul. 31, 1980, Pat. No. 4,366,320. This application Apr. 28, 1982, Ser. No. 372,777
Int. Cl.³ C07D *487/04*
U.S. Cl. 548—264 **5 Claims**

1. An adduct formed by adduct addition of a diene selected from 1α,25-dihydroxycholecalciferol, 25-hydroxycholecalciferol, 24,25-dihydroxycholecalciferol, cholecalciferol and leukotriene B and a compound of the formula



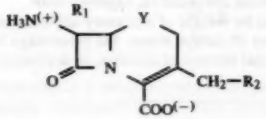
wherein X is fluoro and n is an integer of one to 5, inclusive, or $(X)_n$ is 4'-trifluoromethyl; and A is N=N.

4,481,357
PROCESS FOR THE PREPARATION OF 3-SUBSTITUTED 7-AMINOCEPHALOSPORANIC ACIDS

Alberto Palomo-Coll, and Antonio L. Palomo-Coll, both of Barcelona, Spain, assignors to Gema, S.A., Barcelona, Spain

Continuation-in-part of Ser. No. 393,423, Jun. 29, 1982,. This application Aug. 24, 1982, Ser. No. 410,932
Claims priority, application Spain, Sep. 1, 1981, 505.092
Int. Cl.³ C07D *501/18*; A61K *31/545*
U.S. Cl. 544—016 **1 Claim**

1. In a process for the preparation of a 3-substituted 7-aminocephalosporanic acid of the formula

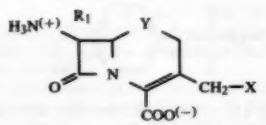


wherein R_1 is either hydrogen, methyl or methoxy; Y is either nitrogen, oxygen, sulphur or sulphoxide; R_2 is either azide or a radical of the formula:

R_3—S—

wherein R_3 is either carbamoyl, C_1–C_4 alkoxycarbonyl, aryloxy, carbonyl, acetyl, phenylacetyl, benzoyl, thienyl, oxazolyl, thioxazolyl, thiadiazolyl, triazolyl, tetrazolyl, benzoxazolyl, pirazolyl, pyridyl, pirazinyl, pyrimidinyl, quinazoline, quinoline, benzimidazolyl, purinyl, pyridine-1-oxido-2-yl, pyridazine-1-oxido-6-yl, tetrazolylpyridizanilyl or thiatriazolyl, which may be substituted by either halogen, C_1–C_4 alkyl, phenyl, hydroxyl, amino, acetamido, nitro, cyano, acyloxy, carboxyl, N,N-dialkyl, C_1–C_4 sulphoalkyl, methoxy, sulphamoyl or carbamoyl, or one or more of said radicals;

said process having as starting compounds a 7-aminocephalosporanic acid represented by the formula



wherein R_1 and Y are as hereinbefore defined, and X is either chlorine, carbamoyloxy, or acetoxy; and a compound selected from the group consisting of sodium azide and a thiol compound represented by the formula

R_3—SH

wherein R_3 is as hereinbefore defined, the improvement comprising adding said starting compounds to an aqueous solution at a temperature of from about 20° to about 95° C., and at an isoelectric pH of from about 4.2 to about 5.9, said aqueous solution comprising water, a tertiary organic base selected from the group consisting of pyridine, meth-

yl- or ethyl-substituted pyridine, C_1–C_4 tertiary alkylamino and bicyclic amidine selected from the group consisting of 1,5-diazobicyclic [5.4.0] undec-5-ene and 1,5-diazobicylic [4.3.0] non-5-ene, and a reaction isoelectric pH regulator selected from the group consisting of carbon dioxide, boric acid, trimethylacetic acid, 2-ethylhexanoic acid and an excess of a previously defined thiol compound; in which aqueous solution a reaction takes place between said starting 7-aminocephalosporanic acid in the zwitterion form and the ionic form R_3—$S^{(-)}$ of said thiol compound or the ionic form $N_3^{(-)}$ of said sodium azide, to obtain a mixture having a process pH analytical profile determined by a composition given by (a) the pH of the thiol and the tertiary organic base mixture, within the range of about 5.0 and 7.5; (b) the pH of the solution containing the 7-aminocephalosporanic acid, within the range of about 4.2 to about 5.9; (c) the reaction isoelectric pH, within the range of about 4.2 to about 5.9; and (d) the isolation pH, comprised between the isoelectric pH of the 3-substituted 7-aminocephalosporanic acid and the reaction isoelectric pH; the components of said mixture being reacted together at a process temperature determined by (a) the 7-aminocephalosporanic acid solution, within a range of about 50° to about 95° C.; (b) a temperature at the reaction isoelectric pH within the range of about 50° to about 85° C.; and (c) an isolation temperature within the range of about 20° to about 70° C.; and with a processing period of between about 15 to about 180 minutes; to obtain a 3-substituted 7-aminocephalosporanic acid of the previously defined formula.

4,481,358
PROCESS FOR PRODUCING DIOXAZINE VIOLET PIGMENT

Iwao Sakaguchi, and Yoshiaki Hayashi, both of Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 22, 1982, Ser. No. 360,771

Claims priority, application Japan, Apr. 10, 1981, 56-54855; Apr. 10, 1981, 56-54856

Int. Cl.[3] **C07D** *265/34;* **C09B** *19/00, 19/02;* **D06P** *1/00*

U.S. Cl. 544—99 **13 Claims**

1. A process for the crystal transformation of dioxazine violet pigment, comprising suspending a metastable dioxazine violet pigment having the type crystal form characteristic in 5.8°, 10.2° and 24.4° at 2θ in the diffraction angle in water mixed with (1) an acetate of an aliphatic or alicyclic alcohol or (2) an aliphatic or alicyclic ketone having 4 to 11 carbons, and heating until a stable dioxazine violet pigment having the β type crystal form characteristic in 5.7°, 10.2°, 17.1°, 23.4° and 28.6° at 2θ in the diffraction angle is obtained.

4,481,359
SILVER HALIDE EMULSION CONTAINING A PURIFIED CYSTEINE-GLUTARALDEHYDE POLYMER FRACTION AND PROCESS OF MAKING

Jacob Beutel, Wilmington, Del., and Raymond J. LeStrange, Hendersonville, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 4, 1982, Ser. No. 336,766

Int. Cl.[3] **C07D** *277/06, 513/04*

U.S. Cl. 546—114 **5 Claims**

1. In a process for forming an adduct of cysteine with glutaraldehyde, the improvement comprising forming a solution of said compounds, in which solution cysteine is present in stoichiometric excess relative to glutaraldehyde; holding the solution at room temperature for a time sufficient to produce a yellow to amber colored reaction mixture; precipitating the reaction mixture by addition to acetone and filtering the precipitate from solution; subjecting the resulting residue to liquid chromatographic separation, whereby three low molecular weight polymer fractions, F1, F2, and F3 are eluted in that order; and recovering the F1 fraction; the aforesaid liquid chromagraphic separation being conducted in a column containing silica particles having a permanently adsorbed phase of octadecylsilane and the eluting liquid being an ammonium acetate/acetic acid buffer at pH 4.8.

2. The low molecular weight polymer fraction F1 produced by the process of claim 1.

4,481,360
4H-1,2,4-TRIAZOL-3-YL COMPOUNDS

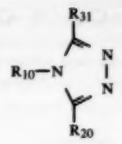
Martin Gall, and John R. Palmer, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 26, 1983, Ser. No. 527,156

Int. Cl.[3] **C07D** *401/04*

U.S. Cl. 546—210 **7 Claims**

1. A compound of the Formula I

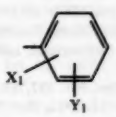


I

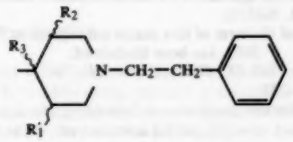
wherein either

(1) R_{10} is a substituent of the Formula II and R_{20} is a substituent of the Formula III or

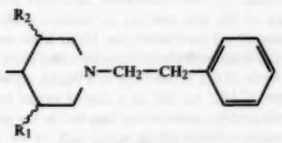
(2) R_{10} is a substituent of the Formula IV and R_{20} is a substituent of the Formula II;



II



III



IV

wherein the wavy lines represent the cis or trans configuration;

wherein R_{31} is

(a) hydrogen,
(b) C_1 to C_2—alkyl,
(c) —SCH_3,
(d) —$S(O)CH_3$,
(e) —S—phenyl,
(f) —S(O)—phenyl,
(g) —$CH(OH)CH_3$,
(h) —$CH_2OC(O)R_{11}$, or
(i) phenyl,

with the provisos that

(1) when R_{20} is the Formula III substituent, R_{31} is —SCH_3, —$S(O)CH_3$, —S—phenyl, —S(O)—phenyl, —$CH(OH)CH_3$ or —$CH_2OC(O)R_{11}$ only when R_3 is hydrogen and

(2) R_{31} is phenyl only when R_{20} is the Formula III substituent and R_3 is —$OC(O)R_{21}$;

wherein X_1 is
(a) o-, m-, or p-fluoro;
(b) hydrogen,
(c) methoxy,
(d) m-acetoxy, or
(e) $(C_1–C_2)$alkyl;
wherein Y_1 is
(a) hydrogen,
(b) m-methoxy, or
(c) $(C_1–C_2)$alkyl;
with the provisos that Y_1 is m-methoxy only when X_1 is p-methoxy; and Y_1 is $(C_1–C_2)$alkyl only when X_1 is $(C_1–C_2)$alkyl;
wherein R_1 is
(a) hydrogen,
(b) $—CH_3$,
(c) $—C_2H_5$, or
(d) $CH_2=CH—CH_2—$;
with the proviso that R_1 is $CH_2=CH—CH_2—$ only when R_{20} is a Formula III substituent;
wherein R_2 is
(a) hydrogen, or
(b) methyl;
wherein R_3 is
(a) hydrogen, or
(b) $—OC(O)R_{21}$;
wherein R_{11} and R_{21} are the same or different and are hydrogen, methyl or ethyl; and the pharmacologically acceptable salts thereof.

4,481,361

PROCESS FOR THE PRODUCTION OF 3-PICOLINE

Rolf Dinkel, Münchenstein; Hilmar Roedel, Therwil, and James I. Grayson, Visp, all of Switzerland, assignors to Lonza Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 337,769, Jan. 7, 1982,. This application May 11, 1983, Ser. No. 493,506
Claims priority, application Switzerland, Jan. 9, 1981, 104/81; Mar. 12, 1981, 1685/81
The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.
Int. Cl.³ C07D *213/08, 213/10*
U.S. Cl. 546—251 **21 Claims**

1. Process for the production of 3-picoline, characterized in that a first educt, consisting of (a) acetaldehyde, (b) at least one acetaldehydeacetal, (c) crotonaldehyde, and (d) a combination of two or more of (a), (b), and (c), is reacted with a second educt, consisting of (e) formaldehyde, (f) at least one formaldehydeacetal, (g) hexamethylenetetramine, and (h) a combination of two or more of (e), (f) and (g), in a liquid, aqueous phase at a temperature of 180° to 280° in a closed vessel in the presence of ammonia and/or ammonium ions and in the presence of at least one water-soluble alkali metal salt of an inorganic and/or organic acid or acids which provides an anion or anions of said inorganic and/or organic acid or acids, which at 20° C. have an acid dissociation constant of 10^{6} to 10^{-12}.

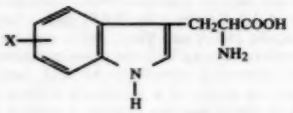
4,481,362

PROCESS FOR PREPARING OPTICALLY ACTIVE TRYPTOPHANES

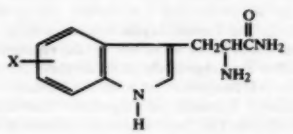
Mamoru Nakai; Tokio Ohshima; Tomio Kimura; Tetsuo Omata, and Noritada Iwamoto, all of Yamaguchi, Japan, assignors to Ube Industries, Inc., Yamaguchi, Japan

Continuation of Ser. No. 276,057, Jun. 22, 1981, abandoned. This application May 17, 1983, Ser. No. 494,692
Claims priority, application Japan, Jun. 24, 1980, 55-84618
Int. Cl.³ C07D *209/20*
U.S. Cl. 548—498 **9 Claims**

1. A process for preparing optically active L-tryptophanes having the formula,



wherein X represents hydrogen, hydroxyl group, halogen atoms, lower alkyl groups or lower alkoxy groups comprising the steps of interacting a DL-tryptophane amide having the formula



wherein X is as defined above with the culture product of a microorganism selected from the group consisting of *Rhizopus chinensis, Gibberella fujikuroi, Trichoderma viride, Torulopsis candida, Candida utilis, Mycobacterium phlei, Nocardia asteroides, Streptomyces griseus, Enterobacter cloacae, Bacillus subtilis, Pseudomonas fluorescens, Klebseilla pneumoniae,* as *Aerobacter aerogenes* and *Rhodotorula glutinis* va. rubescenes and separating the resulting L-tryptophanes from the hydrolyzed mixture.

4,481,363

METHOD FOR PRODUCING MALEIC ANHYDRIDE

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 289,806, Aug. 3, 1981, Pat. No. 4,388,221. This application Jan. 28, 1983, Ser. No. 461,942
Int. Cl.³ C07D *307/60*
U.S. Cl. 549—260 **49 Claims**

1. A method for producing maleic anhydride which comprises reacting a feedstream comprising a gas containing molecular oxygen and a C_4 to C_{10} hydrocarbon under reaction conditions, in contact with an oxidation catalyst described by the formula:

$$V_aP_bSn_cO_dX$$

wherein X is mordenite, a is 0.10 to 1, b is 1, c is 0.001 to 0.30 and d is a number which satisfies the valence requirements of the other elements present.

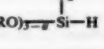
4,481,364

PREPARATION OF AMINOPROPYLTRIALKOXYSILANES AND/OR AMINOALKYLALKOXYSILANES

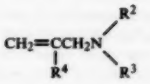
Nan S. Chu, Hartsdale; Bernard Kanner, West Nyack, and Curtis L. Schilling, Jr., Croton-on-Hudson, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 26, 1983, Ser. No. 535,615
Int. Cl.³ C07F *7/08, 7/10, 7/18*
U.S. Cl. 556—413 **26 Claims**

1. An improved process for preparing aminoalkylalkoxysilanes which comprises reacting a hydrosilane of the general formula



wherein a is zero, one or two, and R and R′ are individually monovalent hydrocarbon radicals containing from one to ten carbon atoms inclusive: with an amine of the general formula



wherein R^2 and R^3 are individually selected from the group consisting of hydrogen, monovalent hydrocarbon radicals containing from one to ten carbon atoms inclusive, a phenyl or substituted phenyl group

and $—CH_2CH_2NH)_nH$, wherein n is 1 to 4 and R^4 is individually either hydrogen or a methyl group, said reaction taking place under pressure at a temperature of from 110° to 210° C. in the presence of a platinum-catalyst and, optionally, in the presence of a reaction promoter.

4,481,365

TRIFLUOROMETHYL-PHENOXY-PHENYL-SILICON DERIVATIVES, PROCESSES FOR THEIR PREPARATION, AND THEIR USE AS HERBICIDES AND PLANT-GROWTH REGULATORS

Heinz Förster, Wuppertal; Ludwig Eue, Leverkusen; Robert Schmidt, and Klaus Lürssen, both of Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

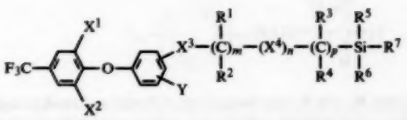
Filed Oct. 12, 1982, Ser. No. 433,923

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141860

Int. Cl.³ C07F *7/08, 7/10*; E05B *65/00, 63/00*

U.S. Cl. 556—422 **17 Claims**

1. A trifluoromethyl-phenoxy-phenyl-silicon compound of the general formula



in which

X^1 and X^2 independently of each other represent a hydrogen, fluorine, chlorine, bromine or iodine atom,

Y represents a hydrogen or halogen atom or a cyano or nitro group,

n is 0 or 1,

m is 0, 1, 2 or 3,

p is 0, 1, 2 or 3,

X^3 and X^4 independently of each other represent oxygen or a —CO—O— group,

R^1, R^2, R^3 and R^4 independently of one another represent a hydrogen atom or a C_1 to C_5 alkyl group,

R^5 and R^6 independently of each other represent a C_1 to C_5 alkyl group, and

R^7 represents a C_1 to C_5 alkyl or hydroxyl group, a chlorine, bromine, or iodine atom or a C_2 to C_5 alkenoxy, C_2 to C_5 alkinoxy,

C_1 to C_5 alkylthio, C_2 to C_5 alkenyl-thio or C_2 to C_5 alkinyl-thio group or a C_1 to C_5 alkoxy group which is straight-chain or branched and optionally substituted by fluorine, chlorine, bromine, iodine, C_1 to C_5 alkoxy and/or C_1 to C_5 alkylthio, or represents a radical of the general formula

wherein

R^8 and R^9 independently of each other represent a phenyl radical which is optionally substituted by fluorine, bromine, and/or iodine, or represent a straight-chain or branched C_1 to C_5 alkyl, C_2 to C_5 alkenyl or C_2 to C_5 alkinyl group,

or wherein

R^8 and R^9, together with the nitrogen atom to which they are bonded, represent a pyrrolidyl radical which is optionally substituted by methyl and/or ethyl, represent a morpholinyl radical which is optionally substituted by methyl, or represent an azacycloheptyl, piperidyl, 3-methyl-piperidyl, 4-methyl-piperidyl, 2-ethyl-piperidyl, 4-ethyl-piperidyl, 2,3-dimethyl-piperidyl, 2,4-dimethyl-piperidyl, 2,5-dimethyl-piperidyl, or 3,5-dimethyl-piperidyl radical.

4,481,366

PROCESS FOR THE PREPARATION OF A TRIFLUOROVINYLSILANE, AND FLUORINE-CONTAINING POLYMER AND PROCESS FOR ITS PREPARATION

Tamejiro Hiyama, and Kiyoharu Nishide, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Jan. 20, 1984, Ser. No. 572,247

Claims priority, application Japan, Jan. 26, 1983, 58-9941; Jun. 2, 1983, 58-96906

Int. Cl.³ C07C *7/08*

U.S. Cl. 556—431 **10 Claims**

1. A process for preparing a trifluorovinylsilane represented by the general formula:

$$(CF_2{=}CF)_nSiR_{4-n} \quad \text{(I)}$$

where each R independently represents an alkyl group, an aryl group or an aralkyl group, and n is an integer of 1 to 4, which comprises reacting chlorotrifluoroethylene with a chlorosilane represented by the general formula:

$$Cl_nSiR_{4-n} \quad \text{(II)}$$

where R and n are as defined above, in the presence of an alkyllithium.

4,481,367

HIGH VISCOSITY POLYOXYALKYLENE GLYCOL BLOCK COPOLYMERS AND METHOD OF MAKING THE SAME

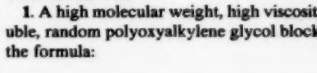
Robert J. Knopf, Saint Albans, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 337,116, Jan. 5, 1982, abandoned, which is a continuation of Ser. No. 106,920, Dec. 26, 1979, abandoned. This application Nov. 22, 1983, Ser. No. 553,880

Int. Cl.³ C07C *125/077, 125/073*

U.S. Cl. 560—026 **16 Claims**

1. A high molecular weight, high viscosity, liquid, water-soluble, random polyoxyalkylene glycol block copolymer having the formula:



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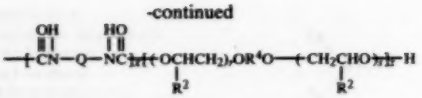


wherein Q is the organic residue from an aliphatic or aromatic diisocyanate selected from the group consisting of 4,4'-methylenebis (4-phenylisocyanate), tolylene diisocyanate, phenylene diisocyanate, 4,4'-methylenebis (cyclohexylisocyanate) and trimethylhexamethylene diisocyanate, or prepolymers derived therefrom having a molecular weight up to about 1500 and essentially free of monofunctional species capable of crosslinking; x is an integer representing the average number of polyurethane blocks in said copolymer and is about 1 to about 10; R^1 and R^2, are mixtures of hydrogen, methyl, or ethyl, with the proviso that the overall content of species wherein R^1 and R^2 are hydrogen must be at least 60 percent by weight; R^3 and R^4, which can be the same or different, are organic residues resulting from the removal of terminal hydrogen atoms from difunctional polyols selected from the group consisting of ethylene glycol, 1,2-propylene glycol, 1,3-propylene glycol, butylene glycol, diethylene glycol, dipropylene glycol, triethylene glycol, bisphenol A and mixtures thereof; y and z represent the average number of polyether blocks in said copolymer with the proviso that the sum of y and z must be from about 1.15 to 1.50 times the value of x; n, m, r, and s, which can be the same or different, are integers wherein n=m and r=s and the sums of n+m and r+s, which can be the same or different, are each in the range wherein each of the polyether blocks in said copolymer has a molecular weight within the range of about 1500 to about 6000; wherein each of said polyether blocks is the residue of a liquid, watersoluble diol of molecular weight from about 1500 to about 6,000 and having a random molecular structure comprising a random copolymer of mixed alkylene oxides selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide wherein about 65 to 85 percent by weight of the total weight of the diol is ethylene oxide, and wherein said block copolymer is water-soluble and suitable for use as a functional fluid in an aqueous medium.

9. A method of preparing the water-soluble, high molecular weight polyoxyalkylene glycol block copolymers of claim 1 which comprises reacting with vigorous agitation and for the time necessary to prepare a hydroxyl-terminated block copolymer a stoichiometric excess of a polyoxyalkylene diol containing at least 60 percent by weight of oxyethylene groups with an organic diisocyanate having molecular weight up to about 1500 wherein the total equivalent of hydroxyl functionality of said diol exceeds the equivalents of isocyanate functionality by a factor of from about 1.15 to 1.50:1.

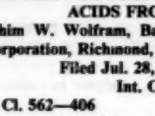
4,481,368

PROCESS FOR PREPARING α-KETO-CARBOXYLIC ACIDS FROM ACYL HALIDES

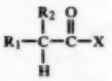
Joachim W. Wolfram, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 28, 1983, Ser. No. 517,970
Int. Cl.³ C07C *51/10*
U.S. Cl. 562—406 **18 Claims**

2. A method of preparing α-keto-carboxylic acids of the general formula:



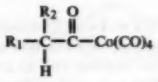
wherein R_1 and R_2 are the same or different and are hydrogen, hydrocarbyl radicals, substituted hydrocarbyl radicals or hydrocarbyloxy radicals which comprise the steps of (i) reacting an acyl halide of the general formula:



wherein R_1 and R_2 are as defined above and X represents halogen, in a liquid solvent medium, with an alkali metal tetracarbonyl cobaltate complex of the formula:

$$MCo(CO)_4$$

wherein M is an alkali metal to form the corresponding acylcobaltcarbonyl complex of the general formula:



wherein R_1 and R_2 are as defined above, (ii) reacting the acylocobaltcarbonyl complex thus formed with carbon monoxide and an alkali metal hydroxide or an alkaline earth metal hydroxide at elevated temperature and elevated pressure in a liquid solvent medium to form the corresponding alkali metal salt or alkaline earth metal salt of said α-keto-carboxylic acid, and (iii) thereafter acidifying the salt of said α-keto-carboxylic acid to form said α-keto-carboxylic acid.

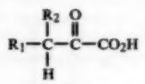
4,481,369

PREPARATION OF α-KETO-CARBOXYLIC ACIDS FROM ACYL HALIDES

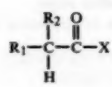
Joachim W. Wolfram, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 28, 1983, Ser. No. 518,022
Int. Cl.³ C07C *51/10*
U.S. Cl. 562—406 **18 Claims**

2. A method of preparing α-keto-carboxylic acids of the general formula:



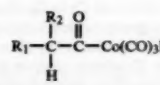
wherein R_1 and R_2 are the same or different and are hydrogen, hydrocarbyl radicals, substituted hydrocarbyl radicals or hydrocarbyloxy radicals which comprise the steps of (i) reacting an acyl halide of the general formula:



wherein R_1 and R_2 are as defined above and X represents halogen, in a liquid solvent medium, with an alkali metal tricarbonyl[triphenylphosphine]cobaltate complex of the formula:

$$MCo(CO)_3PPh_3$$

wherein M is an alkali metal to form the corresponding phenylacetyl tricarbonyl[triphenylphosphine]cobalt complex of the general formula:



wherein R_1 and R_2 are as defined above, (ii) reacting the phenylacetyl tricarbonyl[triphenylphosphine]cobalt complex thus formed with carbon monoxide and an alkali metal hydroxide or an alkaline earth metal hydroxide at elevated temperature and elevated pressure in a liquid solvent medium to form the corresponding alkali metal salt or alkaline earth metal salt of said α-keto-carboxylic acid, and (iii) thereafter acidifying the salt of said α-keto-carboxylic acid to form said α-keto-carboxylic acid.

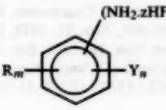
4,481,370

METHOD FOR THE PREPARATION OF BENZENAMINES

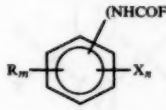
Henry C. Lin, and Byron R. Cotter, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,637
Int. Cl.³ C07C *85/00*
U.S. Cl. 564—394 **29 Claims**

1. A method for the preparation of benzenamine.hydrofluoride complexes of the formula



wherein R is chlorine, fluorine, bromine, phenyl, chlorophenyl, fluorophenyl, or bromophenyl; Y is trifluoromethyl or difluoromethyl; m is 0 to 2; n is 0 to 2; z is about 1 to about 4; and q is 1 to 2; which comprises reacting hydrogen fluoride with a phenyl carbamic fluoride of the formula



where q, m, n, and R are as defined above, and X is trichloromethyl, tribromomethyl, trifluoromethyl, dichloromethyl, dibromomethyl or difluoromethyl with the provision that when X is trichloromethyl, tribromomethyl or trifluoromethyl, Y is trifluoromethyl and when X is dichloromethyl, dibromomethyl or difluoromethyl, Y is difluoromethyl.

4,481,371

METHOD OF MAKING FINE-GRAINED TRIAMINOTRINITROBENZENE

Theodore M. Benziger, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 26, 1983, Ser. No. 517,531
Int. Cl.³ C07C *85/00, 85/26*
U.S. Cl. 564—406 **8 Claims**

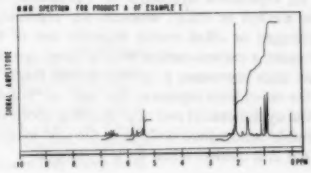
1. A method of forming fine-grained sym-triaminotrinitrobenzene (TATB) comprising the amination of 1,3,5-trichloro-2,4,6-trinitrobenzene (TCTNB) in an emulsion of toluene in water that contains a protective colloid consisting essentially of polyvinyl alcohol and an emulsifying agent, wherein the volume of water in said emulsion is greater than the volume of said toluene, such that the water is the continuous phase and the toluene is the dispersed phase in the emulsion.

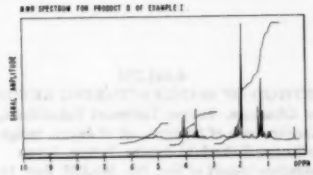
4,481,372

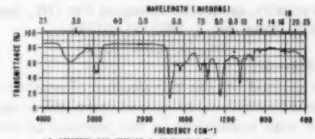
PROCESS FOR PREPARING ALLYL ALPHA AND BETA IONONES AND INTERMEDIATES THEREFOR

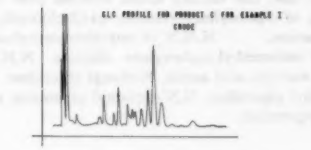
Richard M. Boden, Ocean; Steven D. Temes, Hazlet, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

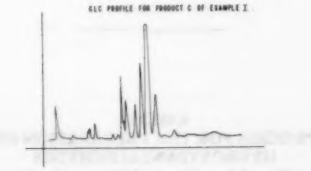
Filed Sep. 30, 1982, Ser. No. 430,941
Int. Cl.³ C07C *49/21, 49/543*
U.S. Cl. 568—378 **8 Claims**

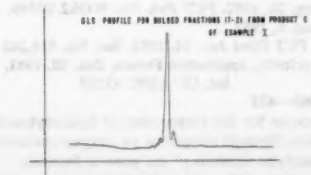




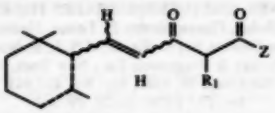








1. At least one compound defined according to the structure:



wherein R_1 represents hydrogen or 2-propenyl; wherein Z represents methyl or OR_2'; wherein R_2' represents methyl, ethyl, hydrogen or alkali metal; wherein one of the dashed lines represents a carbon-carbon double bond and the other of the dashed lines represents a carbon-carbon single bond; and wherein the wavy lines represent the "cis" or "trans" juxtaposition of the cyclohexenyl and acyl moieties about the carbon-carbon double bond which is alpha to the acyl moiety with the proviso that Z is methyl when R_1 is hydrogen.

4,481,373

METHOD OF MANUFACTURING KETONES

Yoshiharu Okumura, Tokyo; Tadamori Sakakibara, and Katsumi Kaneko, both of Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 389,028, Jun. 16, 1982, abandoned. This application Sep. 24, 1982, Ser. No. 422,684

Claims priority, application European Pat. Off., Jun. 28, 1982, 82303361.8; Japan, Jul. 1, 1982, 57-101333

Int. Cl.³ C07C *45/35*

U.S. Cl. 568—401 **1 Claim**

1. In a method for the manufacture of acetone or methyl ethyl ketone by oxidizing propylene or a n-butene optionally in admixture with isobutylene in the presence of water and a catalyst comprising a palladium compound, a copper compound and a halogen, at a temperature in the range of 40° to 140° C. and a pressure in the range of 1 to 50 atmospheres, the improvement which comprises incorporating in the reaction system at least one tertiary amine selected from the group consisting of diphenylmethylamine, tri-(β-chlorethyl) amine, tribenzylamine, N,N,N',N'-tetraphenylethylenediamine, N,N,N'N'-tetramethyl-p-phenylene diamine, N,N,N',N'-tetramethyl succinic acid amide, N-phenyl piperidine, N,2,2,6,6-pentamethyl piperidine, N,N'-diphenyl piperazine and N,N'-diacetyl piperazine.

4,481,374

PROCESS FOR THE PREPARATION OF HYDROXYBENZALDEHYDES

Yani Christidis, and Jean-Claude Vallejos, both of Paris, France, assignors to Societe Francaise Hoechst, Puteaux, France

PCT No. PCT/FR82/00007, § 371 Date Aug. 26, 1982, § 102(e) Date Aug. 26, 1982, PCT Pub. No. WO82/02549, PCT Pub. Date Aug. 5, 1982

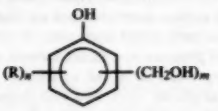
PCT Filed Jan. 14, 1982, Ser. No. 414,243

Claims priority, application France, Jan. 20, 1981, 81 00967

Int. Cl.³ C07C *45/38*

U.S. Cl. 568—432 **9 Claims**

1. A process for the preparation of hydroxybenzaldehydes by oxidation, through oxygen or an oxygen-containing gas, of hydroxybenzylic alcohols of the general formula:



in which m is equal to 1 or 2; n is equal to the difference 5 − m; and the rests R are identical or different, and each represents a hydrogen or halogen atom, or an alkyl, aryl, alkoxy, hydroxy, carboxy, or methylene-dioxy group, or a condensed ring, such process being carried out in a homogeneous aqueous alkaline phase in the absence of noble metal catalyst, at a temperature between 25° and 50° C., and in the presence of sodium or potassium hydroxide, in such quantity that the molar ratio of said hydroxide to hydroxy-benzylic alcohol implemented is between 2.25 and 10.

4,481,375

BINUCLEAR RHODIUM COMPLEX AS A HYDROFORMYLATION AND HYDROGENATION CATALYST

Philippe Kalk, Castanet; René Poilblanc, Castanet Colosan, and Antoine Gaset, Toulouse, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

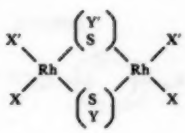
Division of Ser. No. 960,001, Nov. 13, 1978, Pat. No. 4,215,066. This application Nov. 16, 1979, Ser. No. 94,795

Claims priority, application France, Nov. 10, 1977, 7733865

Int. Cl.³ C07C *45/49, 45/50*

U.S. Cl. 568—454 **7 Claims**

1. In the process for the hydroformylation of olefins or in the process for the hydrogenation of organic compounds having at least one unsaturated bond, the improvement comprising carrying out the reaction in the presence of a catalyst having the formula:



wherein X and X' can be the same or different; when X and X' are the same, they are organic tertiary phosphite groups and when different, X is a CO group and X' is an organic tertiary phosphite group or an aromatic phosphine group, and SY and SY' are thiolato groups, there being present from about 10^{-6} to 10^{-2} moles of said catalyst per mole of olefin to be hydroformylated or per unsaturated bond to be hydrogenated.

4,481,376

PROCESS FOR THE SYNTHESIS OF LOWER OLEFINS FROM METHANOL AND/OR DIMETHYL ETHER

Friedrich Wunder, Flörsheim am Main; Ernst I. Leupold, Neu-Anspach, and Heinz Litterer, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 277,735, Jun. 26, 1981, abandoned. This application Feb. 9, 1983, Ser. No. 465,292

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024536

Int. Cl.³ C07C *1/20*

U.S. Cl. 585—640 **3 Claims**

1. A method for the catalytic conversion of methanol, dimethyl ether, or a mixture thereof, to lower olefins, which comprises using an aluminosilicate zeolite catalyst having applied thereto from 0.1 to 10 percent, by weight of the finished catalyst, of ions of hafnium, zirconium, or both, and from

0.1 to 10 percent, by weight of the finished catalyst, of ions of manganese, whereby the life of the catalyst is extended.

4,481,377

DISPROPORTIONATION PROCESS

Simon G. Kukes, and Robert L. Banks, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 22, 1983, Ser. No. 525,518
Int. Cl.[3] C07C 3/62
U.S. Cl. 585—646 9 Claims

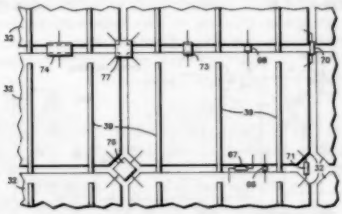
1. In a process for the disproportionation of a feed material comprising at least one disproportionation acyclic olefin having at least 3 carbon atoms per molecule wherein said feed is contacted with a catalyst comprising rhenium oxide on a support comprising thorium phosphate under suitable reaction conditions, the improvement comprising including oxygen in said feed in an amount sufficient to provide an increase in the conversion of at least one of said disproportionable acyclic olefins in said feed.

4,481,378

PROTECTED PHOTOVOLTAIC MODULE

Israel A. Lesk, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 30, 1982, Ser. No. 403,846
Int. Cl.[3] H01L *31/04*
U.S. Cl. 136—244 3 Claims



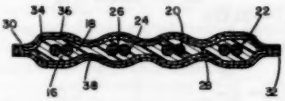
1. An improved photovoltaic module comprising a plurality of photovoltaic cells connected in series, each of said cells having a first side adapted for illumination and having a pattern of metallization thereon and a second side substantially covered by unpatterned metallization, and a plurality of protective diodes, one of said protective diodes coupled in parallel with and poled oppositely to each of said cells, wherein the improvement comprises: said protective diodes comprising discrete diodes attached between said second sides of adjacent photovoltaic cells, and wherein said protective diodes are positioned in spaces between adjacent ones of said plurality of photovoltaic cells.

4,481,379

SHIELDED FLAT COMMUNICATION CABLE

Virgil T. Bolick, Jr., Asheville; Kenneth W. Brownell, Jr., Enka, both of N.C., and Michael W. Elliott, Siloam Springs, Ark., assignors to Brand-Rex Company, Willimantic, Conn.

Continuation-in-part of Ser. No. 333,003, Dec. 21, 1981, abandoned. This application Nov. 24, 1982, Ser. No. 443,636
Int. Cl.[3] H01B *11/00, 7/08*
U.S. Cl. 174—36 10 Claims



1. An electrical communications cable comprising:

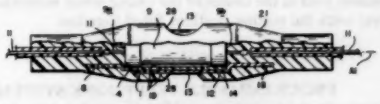
at least first and second substantially coplanar pairs of elongated insulated conductors; each conductor in a pair being closer to the other conductor of the pair than to any conductor of adjacent pairs of conductors; an elongated jacket; said pairs being embedded in said jacket; said jacket for supporting the cable and maintaining the spacing of said pairs of conductors; said jacket being thicker in the regions around each pair and thinner in the regions between each pair forming valleys and ridges on each side of the jacket; an elongated metal shield substantially covering at least one side of said jacket; said shield substantially conforming to and being contiguous with the valleys and ridges on at least one side of the said jacket; whereby pair to pair cross-talk is substantially reduced over a flat shielded cable.

4,481,380

HIGH VOLTAGE INSULATOR FOR ELECTRICAL COMPONENTS HAVING TELESCOPING INSULATIVE SLEEVES

Theodore H. Wood, Bridgewater, and John D. Swaffield, Brockton, both of Mass., assignors to Alden Research Foundation, Brockton, Mass.

Filed Aug. 26, 1982, Ser. No. 411,704
Int. Cl.[3] H05K *5/00*
U.S. Cl. 174—52 PE 6 Claims



1. An insulated high voltage electrical component comprising:

a first sleeve of insulative material telescoping over the component;

a second sleeve of insulative material telescoping over the first sleeve, the first sleeve including an abutment engaging one end of the component and the second sleeve including another abutment engaging the other end of the component; and

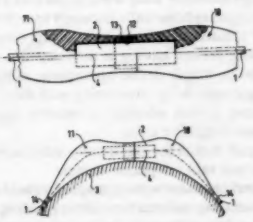
a body of insulative material molded around the sleeves to hold the sleeves in telescoped position, the telescoped sleeves forming a convoluted path outwardly from the component.

4,481,381

DEVICE FOR PREVENTING DAMAGE TO A SUBMARINE CABLE AT THE POINT WHERE IT LEAVES AN EQUIPMENT CASING DURING PASSAGE ROUND THE CABLE DRUM AND OVER THE DAVIT

Lucien Guazzo, and Jean-Patrick Vives, both of Calais, France, assignors to Les Cables de Lyon, Clichy, France

Filed Aug. 4, 1982, Ser. No. 405,016
Claims priority, application France, Aug. 4, 1981, 81 15111
Int. Cl.[3] H02G *15/115, 15/14;* H01R *13/56*
U.S. Cl. 174—135 3 Claims



1. A device for preventing damage to a submarine cable connected directly to a casing during the cable and casing wrapping round a cylindrical drum, said casing having a diameter in excess of that of said cable, such that said cable is spaced from said drum over a given cable length at the outlet of said cable from said casing at each end of said casing, said device comprising two chocking members for positioning at the respective ends of said casing, each chocking member, when unstressed, being in the form of a hollow, generally pear-shaped body of revolution symmetrical about its axis, each pear-shaped body comprising a swollen part for positioning at a respective end of the casing and a tapered part extending from the swollen part for surrounding the cable, said swollen part having a radius of such size that the swollen part, in use, will span the distance between the cable and the drum at the outlet of the cable from the casing and said tapered part having

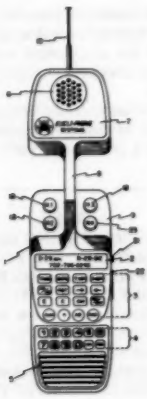
a diameter at the end thereof remote from the swollen part approximately the same as that of the cable on which it is to be applied, each chocking member being of such size that when installed on the cable and casing and when the cable and casing are wound on the drum, it will occupy all the space between the cable and the drum, and said chocking members comprising nesting portions for forming a nesting fit one within the other when they are assembled over a central portion of the casing about which they are adapted to be fitted, the external surfaces of the chocking members being shaped to form a smooth joint at the center of the casing when assembled thereover with the nesting portions fitted together.

4,481,382

PROGRAMMABLE TELEPHONE SYSTEM

Antony-Euclid C. Villa-Real, 2512 Capistrano Ave., Las Vegas, Nev. 89121

Filed Sep. 29, 1982, Ser. No. 428,163
Int. Cl.³ H04Q *7/04*; H04M *11/00*
U.S. Cl. 179—2 EA **12 Claims**



1. A programmable telephone apparatus for use in placing and receiving telephone calls between user and a party having a remotely located telephone unit, comprising:

a computer means having a memory for storing data and commands which define operations on said data and having logic means for processing said data;

a telephone station adapted to receive incoming calls and originate outgoing calls;

logic circuit means for electrically interfacing said computer means and said telephone station;

a clock and calendar means coupled to said computer means for generating information corresponding to time and date and for inputting said information into said computer means;

a keyboard input for said computer means, said keyboard input having a plurality of keys and adapted to program said memory with data corresponding to one or more telephone numbers to be called and the time and date such telephone calls are to be placed;

an alarm means coupled to said computer means and responsive to said clock and calendar means for generating an alarm signal for each of said telephone numbers upon the reaching of the time and date data corresponding to a respective one of said telephone numbers; and

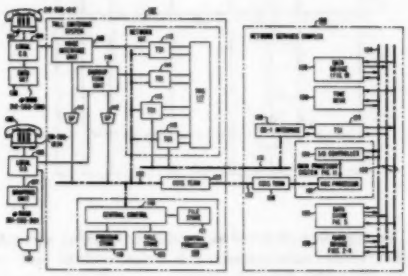
output means responsive to said alarm signal for displaying a respective telephone number corresponding to the actual time and date and for audibly outputting an alarm when the actual time and date occurs for said respective telephone number to indicate that the respective telephone call is ready to be placed.

4,481,383

COMMUNICATION SYSTEM RECORDING ARRANGEMENT

James J. Madon, Lisle, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 20, 1983, Ser. No. 486,990
Int. Cl.³ H04M *15/18*
U.S. Cl. 179—7.1 R **6 Claims**



1. In a communication system having a plurality of customer stations, communication circuits and means for coupling said circuits to said stations, an arrangement for ascertaining the usage of said circuits by said stations comprising:

means for recording the elapsed time that each said station is coupled to an associated one of said circuits for communication,

control means responsive to the uncoupling of a first one of said stations from a first one of said circuits for causing a second one of said stations to utilize a second one of said circuits coupled thereto to control the recoupling of an idle one of said circuits to said first station, and

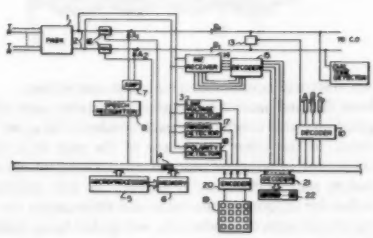
means for deducting from the elapsed time recorded for said second circuit the interval said second circuit is controlling said idle circuit.

4,481,384

VOICE RECOGNIZING TELEPHONE CALL DENIAL SYSTEM

Terrence H. Matthews, Kanata, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Jul. 21, 1981, Ser. No. 285,654
Claims priority, application Canada, Apr. 16, 1981, 375725
Int. Cl.³ H04M *1/66*
U.S. Cl. 179—18 DA **16 Claims**



12. A method of denying a subscriber's line out of a group of subscribers' lines use of a trunk comprising:

(a) detecting seizure of the trunk,

(b) applying a voice recognition circuit to the trunk upon detection of its seizure,

(c) providing for detection of a predetermined voice signal that may be received from the subscriber's line,

(d) monitoring the trunk for the presence of destination code digit signals,

(e) comparing said destination code digit signals with one or a plurality of predetermined destination code digit signals, and

(f) splitting the trunk in the event of the detection of voice signals other than the predetermined voice signal and correspondence of the destination code digit signals with said predetermined one or plurality of signals, whereby further access to the trunk by the subscriber's line is inhibited.

4,481,385

ARRANGEMENT FOR CANCELLING ECHO SIGNALS

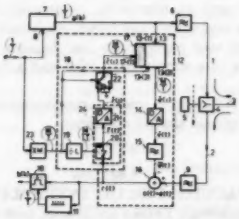
Johannes J. W. Kalfs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1982, Ser. No. 374,122

Claims priority, application Netherlands, May 7, 1981, 8102225

Int. Cl.³ H04B *3/20*

U.S. Cl. 179—170.2 **1 Claim**



1. In an arrangement for cancelling echo signals in a data transmission system having means for transmitting digital data signals to and receiving digital data signals from a transmission path, said arrangement comprising means for providing a synthetic echo signal in response to the data signals transmitted to the transmission path and a digital control signal, a difference producer for forming the difference between the data signal received from the transmission path and the synthetic echo signals, for providing a residual signal, and a control signal generator comprising an analog-to-digital converter arrangement for converting the residual signal into a digital residual signal; the improvement wherein the control signal generator further comprises means sampling said digital residual signal at a rate of M/LT Hz, and an interpolator for providing said digital control signal with a sampling rate which is L times the sampling rate for the digital residual signal, wherein T is the duration of a data symbol in sec. and M and L represent prime integers, L being greater than one.

4,481,386

MULTISTAGE ROTARY SWITCH

Jochen Rose, Rötbenbach, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 18, 1982, Ser. No. 434,953

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142691

Int. Cl.³ H01H *19/04*

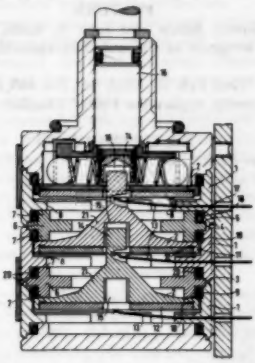
U.S. Cl. 200—11 R **11 Claims**

1. A multistage rotary switch comprising:

plural stacked wafers each including a case member having upper and lower edges, an edge of one such case member being stackable upon an edge of the case member of the next adjacent wafer to form a closed casing, each said case member including grooves on the inner wall of the case member adjacent the upper and lower edges thereof;

a centering ring extending into the grooves adjacent the edges which are stacked to center adjacent stacked case members, said centering ring including a sliding surface thereon;

a rotor in each said case member mounted for rotation therein and bearing against said sliding surface of said



centering ring, said rotor where it bears against said sliding surface and said sliding surface being formed of a material having a low coefficient of friction; and

urging means urging said rotor toward said sliding surface.

4,481,387

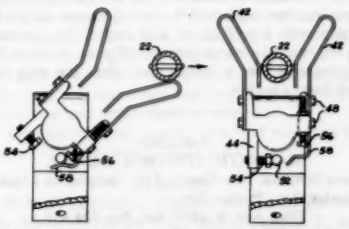
VOLTAGE ISOLATER SWITCH WITH PIVOTED CONTACT ASSEMBLIES

Matthew L. Worrix, Sheridan, Oreg., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Sep. 30, 1983, Ser. No. 537,706

Int. Cl.³ H01H *31/30*

U.S. Cl. 200—48 R **5 Claims**



1. A contact assembly for engaging the movable blade of an electrical switch thereby to form a continuous electrical path through the blade and the contact assembly, comprising;

a bracket including an upstanding support portion;

pivot means having one end affixed to said support portion and extending generally perpendicular thereto;

a saddle member rotatably mounted on said pivot means;

a plurality of resilient conductive shoes affixed to opposite sides of the saddle member and extending therefrom to form an opening for receiving the movable blade; and

stop means for limiting the rotation of the saddle member in a first direction in which the shoes extend in a first direction to encapture an end of the movable blade and in a second direction for allowing ingress or egress of the end of the blade, said stop means including an elongate member extending from said support portion generally parallel to said pivot, and

a spring member depending from said saddle member and interfering with said stop member upon rotation of said saddle member for holding said saddle member in its

rotated-to position, said spring member being an extended portion of at least one of said shoes.

4,481,388

ELECTRICAL PLUG WITH AUTOMATIC SHUT-OFF FEATURE

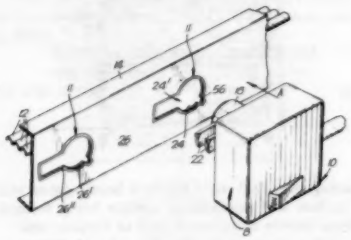
David R. Gillam, Bisley, and John A. Rolfe, Tring, both of England, assignors to Electrak International, Inc., London, England

Filed Feb. 24, 1983, Ser. No. 469,192

Claims priority, application United Kingdom, Feb. 26, 1982, 8205735

Int. Cl.³ H01R *13/70*

U.S. Cl. 200—51 R **7 Claims**



1. In an electrical plug of the type which is designed for insertion into a complementary socket, the plug comprising a plug body housing at least one terminal to which cable leads may be connected, and at least one corresponding contact pin projecting from the body, and a switch electrically connected between the terminal and the contact pin, the switch having first and second conductive elements and a non-conductive manual control element which is movable between an on position, in which the terminal and contact pin are conductively connected via the conductive elements, and an off position in which the terminal and contact pin are electrically isolated from one another, and switch control means adapted to be cooperable with a surface on said socket for automatically moving the control element into the off position when the plug is being inserted into a socket and when the plug is being removed from a socket.

4,481,389

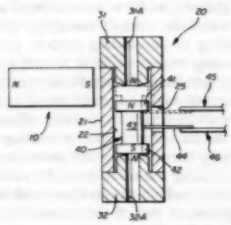
MAGNETIC CONTROL DEVICE

J. Wallace Johnson, New Caney, Tex., assignor to Liquid Level Lectronics, Inc., Porter, Tex.

Filed Aug. 2, 1982, Ser. No. 404,615

Int. Cl.³ H01H *35/18, 9/00*; **F16K** *31/00*; **G01F** *23/10*

U.S. Cl. 200—84 C **11 Claims**



6. A fixed pole magnet means movably positioned relative to a movable shuttle;

housing means carrying said movable shuttle, said shuttle being comprised of magnetizable material capable of having reversible poles formed as a function of the location of said fixed pole magnet means, said shuttle being movable between a first and second position;

first and second members, also comprised of magnetizable material, spacedly positioned at approximately the respective said first and second positions;

float means positioned relative to said fixed pole magnet means adapted to movably float on the surface of a quantity of liquid; and

means for causing movement of said shuttle as a function of the level of said liquid, said movement causing means including said fixed pole magnet means, said movable shuttle, and said first and second members.

8. The level control device of claim **6**, and including:

switch assembly, said switch assembly comprising said first and second members, said shuttle, and a shuttle container, said shuttle container being positioned intermediate said first and second members.

9. The level control device of claim **8**, and including:

said float means and said fixed magnet are positioned at approximately the opposite ends of a lever, said lever being pivotally associated with said housing;

said first and second members each includes passageways therethrough in blockable, communicating relationship with the said shuttle container, each said first and second members' said passageway also being in communication with one of a supply fluid inlet and a further fluid port; and

additional fluid port in said housing communicating with the interior of said shuttle container.

4,481,390

VACUUM CIRCUIT INTERRUPTER

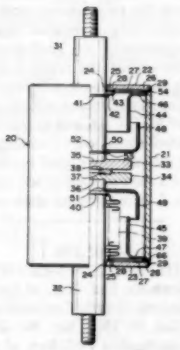
Yoshiyuki Kashiwagi; Yutaka Kashimoto, both of Tokyo; Shinzo Sakuma, Kawasaki; Junichi Warabi, Shizuoka; Yukio Kobari, and Hidemi Kawaguchi, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,302

Claims priority, application Japan, Jul. 1, 1980, 55-90367

Int. Cl.³ H01H *33/00*

U.S. Cl. 200—144 B **16 Claims**



10. A vacuum circuit interrupter comprising:

(a) an evacuated envelope consisting essentially of a metal cylinder made of a brazed metal, first and second electrically insulating disks, a stationary conductive rod, a movable conductive rod, an annular supporting member, and a metal bellows;

(b) the first and second electrically insulating disks abutting against and closing opposite ends of the metal cylinder, each of the first and second disks having a coaxial central aperture, the first and second disks having a coefficient of thermal expansion different from that of the cylinder such

that if there were a direct fixed connection between the disks and cylinder there would be a tendency for the vacuum in the envelope to be destroyed as the envelope temperature changes;

(c) the stationary conductive rod coaxially entering the envelope through the central aperture of the first disk, the stationary rod being fixed to the first disk via the annular supporting member in such a manner as to provide a seal therewith;

(d) the movable conductive rod coaxial with and movably entering the envelope through the central aperture of the second disk without impairing the vacuum inside the envelope;

(e) stationary and movable electrodes respectively connected to the stationary and movable rods in such a manner as to engage each other when the movable rod moves toward the stationary rod and disengage from each other when the movable rod moves away from the stationary rod;

(f) the metal bellows surrounding the movable rod inside the envelope, first and second ends of the bellows being respectively fixed to the movable rod and to the second disk in such a manner as to provide a seal about the movable rod to allow for movement of the movable rod without impairing the vacuum inside the envelope;

(g) means for overcoming the tendency for the vacuum in the envelope to be destroyed as the envelope temperature changes even though the envelope is formed of a relatively inexpensive alloy having a coefficient of thermal expansion which does not closely match that of the disks;

said means for overcoming including:

(i) a metallized layer on a face of each insulating disk abutting against the cylinder;

(ii) the brazed metal directly connecting the metallized layers to opposite ends of the cylinder;

the brazed metal forming the metal cylinder being made of a material that is relatively easy to deform by thermal stresses generated during a gradual cooling process after brazing, wherein each hermetic fixing and seal between the metal cylinder and the first and second insulating disks is obtained by plastically deforming both brazing portions of the metal cylinder abutting against the insulating disks after brazing the metal cylinder to the insulating disks; and

(iii) the evacuated envelope being completely produced by a last heating of brazing in vacuum.

4,481,391

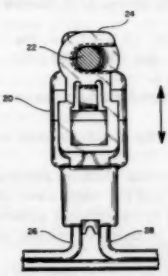
MOLDED SWITCH HEAD

Ralph C. Clement; Charles W. Parmenter, both of Bellefontaine, and William T. Lockwood, Huntsville, all of Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Mar. 31, 1982, Ser. No. 364,081

Int. Cl.³ H01H *1/42*

U.S. Cl. 200—163 **8 Claims**



1. An improved switch head for engaging and making electrical contact between first and second electrical conductors, said switch head comprising:

(A) lower and upper insulating head sections;

(B) a contact slug contained within said lower insulating head section for contacting and making electrical connection with the first and second conductors;

(C) biasing means operatively positioned within said lower insulating head section to engage and thereby urge the first and second conductors toward oppositely facing surfaces of said slug when the latter is engaged with the first and second conductors;

(D) clamping means for holding said lower and upper insulating head sections together, wherein said clamping means places said lower and upper insulating head sections in compression when the contact slug engages the first and second conductors and wherein said clamping means applies force to said lower head section to disengage the contact slug from the first and second conductors when a force is applied to said clamping means in a direction away from the two conductors;

(E) said lower and upper insulating head sections having protruding abutments on their outer surface for engaging said clamping means; each of said lower and upper insulating head sections having at least two oppositely opposed protruding abutments, said abutments of said lower and upper sections being aligned when said lower and upper insulating head sections are assembled, and wherein said abutment on said lower head section has a groove on a lower end and said abutment on said upper section has a recess on an upper end, said upper head section also has a recess on an upper end, said upper head section also having near each abutment a pair of walls, each wall having a clamp engaging portion;

(F) said clamping means including first and second clamps, each of said clamps comprising:

(1) a main portion having first and second ends and a central opening for surrounding said abutments of said lower and upper head sections, said second end of said main portion engaging said groove in said lower end of said abutment on said lower head section;

(2) a finger attached to said first end of said main portion for engaging said recess in said upper end of said abutment on said upper head section;

(3) a pair of shoulders on said first end of said main portion for engaging said clamp engaging portion of said pair of walls on said upper head sections; and

(4) a hanger attached to said first end of said main portion.

4,481,392

DEVICE FOR COOKING FOODS WITH MICROWAVES

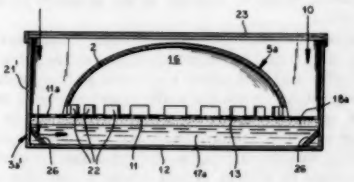
Bodo B. Nibbe, Karlsplatz 6/IV, 8000 München 2, and Paul Hirsch, Karl-Theodor-Str. 91, 8000 München 40, both of Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,964

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106236

Int. Cl.³ H05B *6/80*

U.S. Cl. 219—10.55 E **4 Claims**



1. A device usable with a cooking stove equipped with a

microwave source for rapidly boiling foods not suitable for cooking with direct microwave radiation, comprising:

a vessel positionable below said source in a field of microwaves incident from above, said vessel comprising a metallic bottom and a metallic peripheral wall, said vessel forming a vapor space above an area reserved for a quantity of water to be vaporized by incident microwaves;

a receptacle overlying part of said vessel and communicating with said vapor space for admitting evolving steam to foods disposed in said receptacle; and

a radiation shield covering said receptacle for protecting the contents thereof from said microwaves, said receptacle and said radiation shield leaving a portion of said vessel exposed to microwaves incident from above, said area extending into said exposed portion.

4,481,393

CONTROL APPARATUS FOR HEATING APPLIANCE

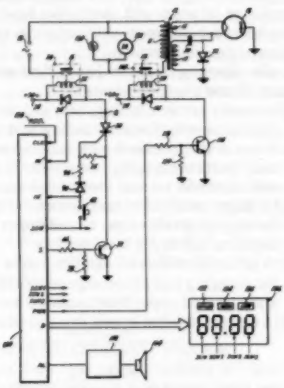
Shigeki Ueda, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 5, 1982, Se.. No. 365,267

Claims priority, application Japan, Apr. 16, 1981, 56-58233

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **10 Claims**



1. An apparatus for control of a heating appliance, comprising:

heating means for producing heating energy;

power control means for controlling the supply of power to said heating means;

a start switch actuable to energize said power control means;

a control circuit coupled to said power control means for activating said power control means to apply power to said heating means in response to the actuation of said start switch;

control means for controlling the operation of said control circuit, said control means including first means for sensing whether said start switch is actuated and for producing a start signal responsive to the actuation of said start switch, said start signal causing said control circuit to activate said power control means and to produce a control signal indicative thereof and second means for sensing the presence or absence of said control signal after the lapse of a predetermined time period to affect the operation of said power control means in accordance with the state of said control signal.

4,481,394

COMBINED MICROWAVE OVEN AND GRILL OVEN WITH AUTOMATED COOKING PERFORMANCE

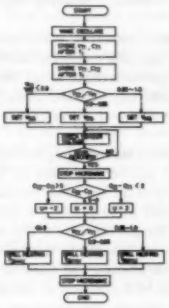
Takeshi Tanabe, Higashiosaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1982, Ser. No. 398,548

Claims priority, application Japan, Jul. 21, 1981, 56-114671; Jul. 27, 1981, 56-117278; Nov. 11, 1981, 56-181662

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **3 Claims**



1. A combined microwave oven and grill oven comprising:

a heating chamber in which foodstuff is heated;

a microwave source and grill means for heating foodstuff in said chamber;

a first sensor for detecting a first characteristic of the atmosphere in said chamber and for providing a first output voltage indicative of said first characteristic;

a second sensor for detecting a second characteristic of the atmosphere in said chamber and for providing a second output voltage indicative of said second characteristic;

means for determining from variations in said first output voltage the kind of foodstuff being heated in said chamber and for controlling completion of microwave heating in response to said first output voltage; and

means for controlling heating of said foodstuff by said grill means in response to said second output voltage.

4,481,395

RESTRICTIVE INSERT FOR MICROWAVE OVENS

Charles M. Smith, 160 E. Brandy La., Merritt Island, Fla. 32952; Robert W. Penn, 2805 Kenyon Ave., Cocoa, Fla. 32922, and George W. Pangborn, 4510 Beacon Ct., Titusville, Fla. 32780

Filed Sep. 13, 1982, Ser. No. 416,982

Int. Cl.³ H05B *9/06*

U.S. Cl. 219—10.55 E **9 Claims**

1. A restrictive insert for a microwave oven cavity comprising:

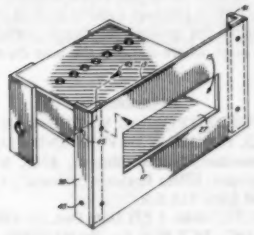
a front plate having a substantially rectangular opening therein;

a horizontally disposed platform attached to the front plate and extending into the microwave cavity whereby only items having a cross-sectional contour smaller than the contour of the rectangular opening can be heated in the microwave oven;

a first vertically disposed leg attached to one corner of the platform;

a second vertically disposed leg attached to the other corner of the platform; and

means for attaching the front plate to the microwave oven cavity;



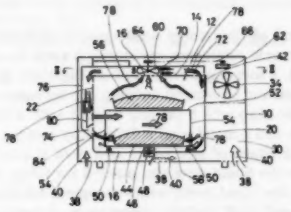
whereby said platform is within the microwave radiation field in the central portion of said microwave oven cavity.

4,481,396

COMBINATION MICROWAVE AND CONVECTION OVEN

Kazuyuki Matsubayashi, Amagasaki, and Koichi Tateda, Yao, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 255,093, Apr. 17, 1981, abandoned. This application Mar. 22, 1983, Ser. No. 477,644
Claims priority, application Japan, Apr. 22, 1980, 55-53708
Int. Cl.³ H05B 6/64
U.S. Cl. 219—10.55 B **6 Claims**



1. A combination microwave oven and heated air circulating type oven which ensures uniform heating at different levels within an oven cavity which comprises:

an outer housing;

an oven cavity surrounded by a ceiling wall, a bottom wall and first and second side walls, said oven cavity disposed within said outer housing and defining a clearance therebetween;

upper support means and lower support means disposed in said oven cavity for supporting foodstuff to be cooked in the upper and lower portion of said oven cavity respectively,

a magnetron disposed in said clearance and supplying microwave energy to said oven cavity through said ceiling wall;

an intake aperture formed near the center of the ceiling wall surrounding said oven cavity;

a first blowoff aperture formed in said ceiling wall near the corner confronting the first side wall of said oven cavity;

a second blowoff aperture formed in a lower portion of the second side wall of said oven cavity, said second side wall of said oven cavity, said second side wall defining the opposite side to said first side wall, the arrangement of said first blowoff aperture on one of the side walls being different from the arrangement of said second blowoff aperture on the other side wall;

circulation duct means disposed in said clearance and secured to said ceiling wall and said second side wall of said oven cavity for housing and providing communication between said intake aperture and said first and second blowoff apertures at the outside of said oven cavity, said intake aperture and said first and second blowoff apertures communicating with said circulating duct means;

circulating fan means for creating a forced air flow in said duct means from said intake aperture to said first and second blowoff apertures, said forced air flow being directed into said oven cavity through said first and second blowoff apertures; and

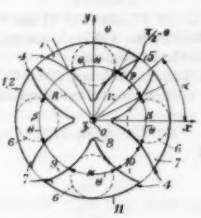
heater means disposed in said duct means for heating up the forced air flow whereby the heated air generated from the first blowoff aperture heats up the upper surface of the foodstuff disposed on the upper support means and the lower surface of the foodstuff disposed on the lower support means and the heated air generated from the second blowoff aperture heats up the lower surface of the foodstuff disposed on the upper support means and the upper surface of the foodstuff disposed on the lower support means.

4,481,397

APPARATUS FOR THE MAGNETIC INDUCTION HEATING OF FLAT, RECTANGULAR METAL PRODUCTS TRAVELING IN THEIR LONGITUDINAL DIRECTION

Jean Maurice, Paris; Roger Travers, Chatenay-Malabry, and Jean-Paul Camus, Mantes la Jolie, all of France, assignors to CEM Compagnie Electro Mecanique, Paris, France

Filed Nov. 12, 1982, Ser. No. 441,094
Claims priority, application France, Nov. 13, 1981, 81 21238
Int. Cl.³ H05B 6/10
U.S. Cl. 219—10.61 R **5 Claims**



1. Apparatus for the magnetic induction heating of rectangular, flat metal products, traveling in the direction of their longitude, comprising:

at least one inductor capable of producing a controllable magnetic field of constant intensity oriented essentially perpendicular to a wide face of the metal product to be heated, the inductor being mounted so as to rotate about an axis perpendicular to the wide face of the metal product, the inductor comprising at least two magnetic poles each having a polar surface oriented toward the wide face and parallel to it and sweeping an annular zone when the inductor is rotating, the polar surface of each pole having the shape of a curvilinear triangle having an apex directed toward the axis of rotation of the inductor, the polar surface having two concave sides which are symmetrical with respect to a straight line passing through the apex and perpendicular to the axis and a convex side of a circular arc centered on the axis, the radius of curvature of the convex side being essentially equal to the external radius of the annular zone swept by the polar surfaces of the poles.

4,481,398

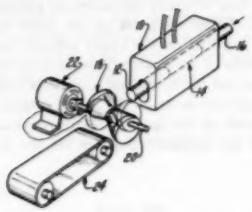
MULTI-DIRECTIONAL OSCILLATING BREAKOFF MECHANISM FOR SEPARATING BILLETS

Paul N. Lavins, 338 Moran, Grosse Pt. Farms, Mich. 48236, and Thomas R. Bogan, 14614 Hillsdale, Sterling Heights, Mich. 48078

Filed Sep. 13, 1982, Ser. No. 417,284

Int. Cl.³ H05B 6/10

U.S. Cl. 219—10.69 **8 Claims**



1. In a system for heating elongated billets passing through a heater unit in an end-to-end relationship and exiting therefrom, the improvement comprising:

a roller adjacent the exit of the heater unit and mounted for rotation about an axle extending normal to the path of travel of the billets exiting the heater; means for rotating said roller; and

means for presenting asymmetrical roller surface portions relative to the axle for contacting the exiting billet and moving the billet in an multi-directional pattern having varying horizontal and vertical components of motion transverse to the longitudinal axis of the billet as the roller rotates, whereby the motion of the exiting billet serves to separate it from adjacent billets in the heater.

4,481,399

WELDING OF TUBES TO TUBE PLATES

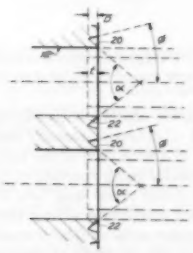
Alan Greenfield, Rotherham, England, assignor to Robert Jenkins & Co., Rotherham, England

Filed Aug. 9, 1982, Ser. No. 406,332

Claims priority, application United Kingdom, Aug. 17, 1981, 8125098

Int. Cl.³ B23K 9/02

U.S. Cl. 219—60.2 **6 Claims**



1. A method of welding a tube to a tube plate and involving the use of a non-consumable electrode mounted at one end of a rotatable holder the electrode being positioned adjacent the end of the tube which has been entered into a hole in the tube plate so that as the holder rotates the arc which is produced between the electrode and the tube generates intense heat and locally melts the wall of the tube and an adjacent area of the tube plate, the two thereby being fused together along the whole distance by which the tube has been entered into the tube plate, the method including the initial step of machining the tube plate to produce an annular groove in that face of the tube plate from which the tube is to be entered into the tube plate, the annular groove being concentric with the hole in said tube plate, and to further produce a sleeve portion of tube plate metal radially within the groove, the sleeve portion tapering down to a sharp edge where it meets the hole diameter.

4,481,400

METHOD OF ELECTROSLAG WELDING OF LIGHT METALS, FORMING DEVICE AND FLUX

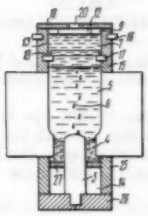
Anatoly N. Safonnikov, Ulitsa Filatova, 1/22, kv. 78, and Anatoly V. Antonov, Ulitsa Kreisera "Avrora", 1, korpus 2, kv. 104, both of Kiev, U.S.S.R.

PCT No. PCT/SU81/00040, § 371 Date Dec. 21, 1982, § 102(e) Date Dec. 21, 1982, PCT Pub. No. WO82/03585, PCT Pub. Date Oct. 28, 1982

PCT Filed Apr. 22, 1981, Ser. No. 456,050

Int. Cl.³ B23K 25/00

U.S. Cl. 219—73.1 **22 Claims**



1. A method of electroslag welding of light metals to produce a desire weld reinforcement in which parts having edges to be welded, a forming device, and an electrode are successively mounted and a required welding gap between said parts provided, following which the gap is filled with a flux, a slag pool is set up and a metal pool is formed by melting the electrode and the edges of said parts, said pool is accumulated, maintained in the liquid state and utilized for filling the welding gap with the liquid metal with subsequent solidification of the liquid metal, said method comprising: accumulating the metal pool outside the gap above the parts being welded; and filling the gap with the liquid metal after fusion of the electrode and the edges of the parts has been completed and the accumulated metal pool has a volume sufficient to fill the gap in view of the desired weld reinforcement.

7. A forming device for electroslag welding of light metals, comprising moulds, a container disposed above parts to be welded, and a container disposed under the parts to be welded, wherein the moulds are further provided with porous elements and constructed with longitudinal grooves which are rectangular in shape and parallel to one another and which form a supporting platform on which are disposed said porous elements forming together with the grooves enclosed cavities, the container disposed above the parts being further provided with external and internal terminals, a jumper connecting the internal terminals and the container disposed under the parts is further provided with a transverse partition.

4,481,401

PROCESS FOR WELDING COATED PLATES

Bernard Humblot, Bazemont, France, assignor to Steelweld France, Chatou, France

Filed Jan. 27, 1982, Ser. No. 343,261

Claims priority, application France, Sep. 24, 1981, 81 18007; Oct. 19, 1981, 81 19595

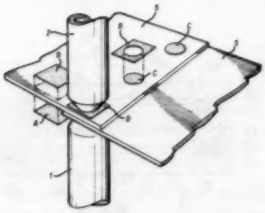
Int. Cl.³ B23K 11/10

U.S. Cl. 219—91.2 **14 Claims**

1. A process for welding coated plates wherein at least one

welding electrode is applied on a said plate to be welded, comprising:

(a) interposing a strip material between said electrodes and a coated surface of said plate to be welded, said strip material comprising an alloy of copper and a metal capable of being alloyed with said coating of said plate to be welded; and



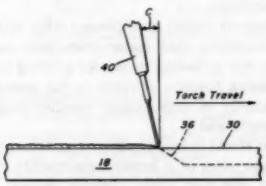
(b) welding said plate such that during welding, a portion of said strip material which is in contact with said electrode and said plate to be welded is alloyed with said coating, so that a part of said strip material is detached to form a coating to replace a part of said coating removed by said welding of said plate.

4,481,402

MULTI-POSITION PLATE WELDING USING MODIFIED DOUBLE-J JOINT

Malcolm G. Hoy, New Kensington, and Michael M. Ball, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 27, 1982, Ser. No. 424,145
Int. Cl.³ B23K *33/00*
U.S. Cl. 219—137 R **25 Claims**



1. A method of gas metal arc welding aluminum or aluminum alloy plates comprising the steps of:

(a) providing a first and second aluminum plate having abutting edges which form a weld line, the abutting edge of the second plate including a tongue portion having (1) a land surface abutting a portion of the edge of said first plate, and (2) two arcuate J-shaped side surfaces, each adjoining the land surface at opposite ends thereof and each adjoining its respective side surface of the second plate at an angle approximating 90°, the J-shaped side surfaces of the tongue portion and surface of the first plate cooperating to define a modified double-J welding groove, thereby providing a first weld groove on one side of the plates and a second weld groove on the other side of the plates;

(b) welding the plates together by depositing a first weld bead in the first weld groove to completely fill said groove in a single pass;

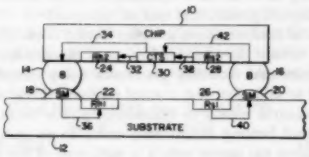
(c) after said first weld bead has sufficiently solidified, depositing a second weld bead in a single pass in the second weld groove, said second weld bead completely filling said second groove and extending into said first bead to completely penetrate that portion of the weld line not penetrated by said first weld bead said welding of steps (b) and (c) being carried out by impressing a direct current of 290 to 420 amperes between an electrode of a welding torch and said plates with the electric arc formed thereby shielded primarily by argon gas, the torch maintaining a positive lead angle relative to the plate surface.

4,481,403

TEMPERATURE CONTROL OF SOLID STATE CIRCUIT CHIPS

Lou A. Del Monte, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 4, 1983, Ser. No. 471,986
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—209 **9 Claims**



1. Apparatus for use with first and second components joined by connection means to relieve the stress in the connection means due to temperature effects which cause different expansions and contracts between the first and second components comprising:

first heater means proximate the first component;

energizing means connected to said first heater means;

temperature sensing means proximate the first and second components to sense the temperatures thereof; and

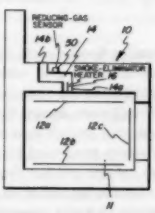
control means connected to said temperature sensing means and to said energizing means and operable in accordance with a first predetermined temperature relationship between the first and second components to energize the said first heater means to heat the first component to an extent sufficient to offset the difference in expansion and contraction of the components.

4,481,404

TURN-OFF CONTROL CIRCUIT FOR SELF-CLEANING OVENS

Charles E. Thomas, Scotia, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,223
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—398 **20 Claims**



1. A self-cleaning thermal oven and control therefor, comprising:

a thermal cooking oven cavity;

electrically-energizable means within said oven cavity for thermally heating the interior of said cavity to a temperature at least high enough to pyrolyze cooking soil within said cavity and convert said soil to an effluent capable of flowing out of said oven cavity;

a smoke eliminator comprising a passage, extending from the interior of said oven cavity to external atmosphere;

an electrically-energizable smoke eliminator heater disposed to heat effluent which flows from said thermal oven cavity and through said passage, said smoke eliminator heater being operable to oxidize partially pyrolyzed components in the effluent produced by said oven heater means;

a reducing gas sensor fixed relative to said smoke eliminator passage at a position before the end of said passage furthest from said oven cavity and exposed to at least a portion of said effluent which flows from said oven cavity and through said passage, said reducing gas sensor producing an electrical output related to the concentration of pyrolyzed products in said effluent; and

electrical control means coupled to said oven thermal heating means for connecting and disconnecting power thereto, said reducing gas sensor being electrically coupled to said electrical control means to cause said electrical control means to disconnect power from said oven thermal heating means responsive to an output of said reducing gas sensor which is indicative of the completion of the oven cleaning process and of a pyrolyzed product concentration in said effluent which is less than a given amount.

4,481,405

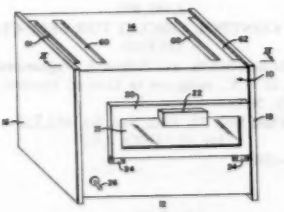
COOKING APPLIANCE

Franklin S. Malick, 518 Greenleaf Dr., Monroeville, Pa. 15146

Filed Apr. 27, 1983, Ser. No. 489,095

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—405 **16 Claims**



1. Apparatus for heating food sealed within a plastic pouch which comprises an enclosure, a grid within said enclosure on which said pouch is positioned for cooking, incandescent electric lamps within said enclosure, means for supplying a source of power to said lamps, and switch means actuable by expansion of said pouch by steam generated by heat from the lamps for disconnecting the power source from said lamps, said switch means being actuable by deflation of said pouch upon condensation of the steam to again connect said power source to said lamps, whereby repeated connection and disconnection of the power source will maintain a steam atmosphere required for cooking.

4,481,406

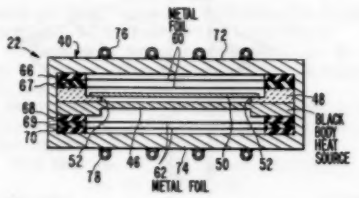
HEATER ASSEMBLY FOR THERMAL PROCESSING OF A SEMICONDUCTOR WAFER IN A VACUUM CHAMBER

Richard S. Muka, Topsfield, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 21, 1983, Ser. No. 459,745

Int. Cl.³ H05B *3/22*

U.S. Cl. 219—411 **6 Claims**



1. Apparatus for thermal processing of a semiconductor wafer comprising:

a processing chamber;

means for controlling the pressure in said processing chamber;

wafer handling means for introducing and removing said semiconductor wafer from said processing chamber; and

a heater assembly positioned in said processing chamber and adapted for rotation between a wafer-receiving position in which said wafer is received from said wafer handling means and a wafer-ejecting position in which said wafer is ejected to said wafer handling means, said heater assembly comprising:

a housing including a slot for slidably receiving and ejecting said wafer and heat sink means for removal of thermal energy,

a blackbody source having a constant planar energy flux characteristic;

wafer support means in alignment with said slot for slidably receiving said wafer from said wafer handling means and including means for guiding said wafer to a processing position adjacent to but spaced apart from said source in substantially parallel planar alignment therewith, and

radiation shield means positioned within said housing on opposite sides of a heater subassembly including said source and said wafer support means, said housing substantially enclosing and supporting said source, said wafer support means and said radiation shields means in fixed relative positions

whereby said heater assembly prevents substantial radiation of thermal energy into said processing chamber and provides a mechanically stable relationship between said source and said wafer.

4,481,407

ELECTRIC HOTPLATE

Paul W. Stokes, Ringwood; Brian C. Doody, Camberwell, and Harold K. Lill, Thomastown, all of Australia, assignors to Stokes (Australasia) Limited, Ringwood, Australia

Filed May 11, 1981, Ser. No. 262,505

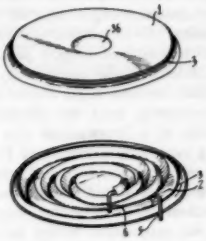
Claims priority, application Australia, May 12, 1980, PE3502

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—457 **25 Claims**

1. An electric hotplate formed by taking a heating element comprising an unsheathed resistance wire which exhibits a substantial increase in resistivity with increase in temperature thereof, an insulating material around the wire and a metal casing enclosing the wire and insulating material, locating said element in a mass of metal powder, compressing said mass to

form a body containing said element, and heat treating said body in a furnace at 1100° C. for 30 minutes, followed by



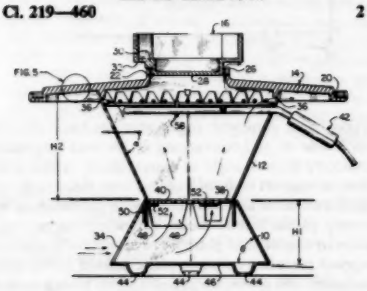
steam-treating for 45 minutes at 580°–620° C., to form an electric hot plate having said element embedded therein.

4,481,408

COOKING APPARATUS

John H. Scheufler, 3940 Gresham, Ste. 315, San Diego, Calif. 92109

Filed Nov. 7, 1983, Ser. No. 549,088
Int. Cl.³ H05B 3/68
U.S. Cl. 219—460 2 Claims



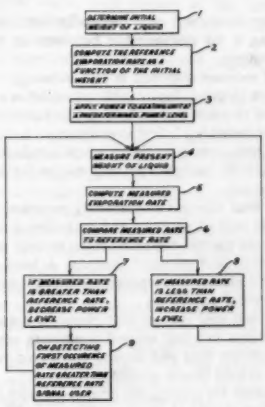
1. A cooking apparatus comprising:
an upwardly converging hollow metal base;
an upwardly diverging hollow metal pot having a lower end connected to an upper end of the base;
a metal platter removably mountable over an upper end of the pot so that it extends generally horizontally and provides an upwardly facing cooking surface;
an air intake vent in the base;
a plurality of exhaust vents formed along an edge defining the upper end of the pot;
an exhaust opening formed in the center of the platter;
a metal dish mounted in the exhaust opening in the platter and configured so that selective rotation thereof about a vertical axis will vary the degree of obstruction of the exhaust opening;
metal grate means extending horizontally between the base and the pot for supporting a combustible material for providing a source of cooking heat;
a metal grill having a plurality of spaced apart elongate members having ends removably receivable in individual ones of the exhaust vents so that the grill may be supported horizontally across the upper end of the pot beneath the platter;
an electric heater having a handle and a heat element having a main portion shaped in the form of a closed curve and two terminal portions which extend into the handle;
the grill having metal supports on its lower side for removably receiving and supporting the main portion of the heat element; and
the pot having a pair of slots formed on the edge defining the upper end of the pot for receiving and supporting the terminal portions of the heat element;
whereby the apparatus may be utilized outdoors by igniting wood or charcoal on the grate and cooking on the platter or by removing the platter and cooking on the grill, or alternatively, the apparatus may be utilized indoors by inserting the electric heater beneath the grill, connecting the electric heater to a source of electric power, and cooking on the grill with the platter removed, or cooking on the platter when installed on top of the pot, grill and electric heater.

4,481,409

METHOD AND APPARATUS FOR LIMITING THE EVAPORATION RATE OF LIQUIDS HEATED BY COOKING APPLIANCE SURFACE UNITS

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 3, 1982, Ser. No. 438,770
Int. Cl.³ H05B 1/02
U.S. Cl. 219—518 14 Claims



1. A method of controlling the evaporation rate of a liquid being heated by an electric cooking appliance of the type having heater means and including means for controlling the output power of the heater means over a range of discrete power levels including a maximum power level, comprising the steps of:
measuring the initial weight of the liquid to be heated;
energizing the heater means at a predetermined power level;
repetitively measuring the present weight of the liquid being heated during the cooking period;
computing the rate of change of the weight of the liquid being heated;
comparing the computed rate of change to a reference rate of change corresponding to a desired evaporation rate to detect a rate of change greater than the reference rate signifying that the liquid has begun to boil; and
decreasing the output power of the heating means to a lower power level when the computed rate of change is greater than the reference rate, and thereafter increasing the output power of the heating means to a higher power level when the computed rate decreases below the reference rate.

4,481,410

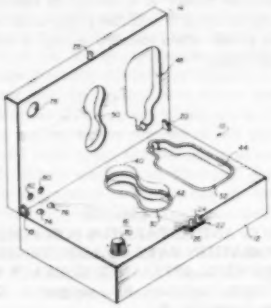
FAIL SAFE STERILIZING APPARATUS AND A CIRCUIT THEREFOR

Kenneth A. Bortnick, Rte. 2 Box 154, Parsonsburg, Md. 21849

Filed Sep. 27, 1983, Ser. No. 536,316

Int. Cl.³ F27D 11/02

U.S. Cl. 219—521 **18 Claims**



1. A fail safe sterilizing apparatus for simultaneously sterilizing lenses contained in a lens case and a bottle of rinse solution, comprising:

(a) a housing comprised of a thermally insulating material and having a lid displaceable between an open and a closed position;

(b) a pair of recesses disposed in said housing;

(c) a first heat element displaceable mounted in a first one of said pair of recesses and including a first contoured recess therein for receiving a first container;

(d) said first heat element includes a heat conductive element and electrically operable heating means for heating said first container;

(e) a second heat element displaceably mounted in a second one of said pair of recesses and including a second contoured recess therein for receiving a second container;

(f) said second heat element includes a heat conductive element and electrically operable heating means for heating said second container;

(g) said first and said second heat elements being displaced when said first and said second containers are positioned in said associate first and second contoured recesses and said lid is in said closed position;

(h) switch means are electrically connected with each of said first and second heat elements and are operable only when both said first and second heat elements have been displaced by said closed lid for thereby permitting operation of said associated heating means;

(i) a control means including an electrical control circuit is electrically connected with said switch means and each of said heating means for simultaneously energizing said heating means; and

(j) means are electrically connected with said control means for connecting said control means to a source of electric power.

4,481,411

ELECTRICAL HEATER RACK ASSEMBLY WITH STAND-OFF INSULATORS

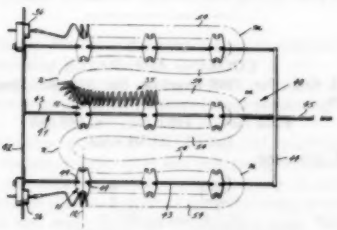
James E. Roth, DeSoto, Mo., assignor to Intertherm Inc., St. Louis, Mo.

Filed Dec. 21, 1983, Ser. No. 564,001

Int. Cl.³ H05B 3/06

U.S. Cl. 219—532 **1 Claim**

1. A heater rack assembly, comprising a plurality of insulators, each having a body portion including an inward support part having a transverse axis of symmetry and means along such transverse axis for mounting onto a rack frame, further having a longitudinal axis of symmetry extending perpendicular to such transverse axis, the insulator being substantially planar about the plane defined by the said transverse and longitudinal axes, linear abutment edges, adjacent to and converging at said longitudinal axis of symmetry, whose angle of convergence, directed toward said support part, is substantially 150° or less, the insulator further comprising, commencing at the ends of said linear abutment edges remote from such longitudinal axis of symmetry, hook-like projections extending symmetrically about such longitudinal axis, said hook-like projections having outer edges continuing from the sides of said body portion and sloping toward said longitudinal axis of symmetry and terminating spacedly therefrom in inner edges facing said longitudinal line of symmetry, thereby providing a throat, said hook-like projections further having linear hook rear edges parallel to and spaced from the linear abutment edges of the body portion, whereby their said spacing from the



body portion linear abutment edges provides linear slot portions at each side of, and converging at, the said longitudinal line of symmetry at such angle of convergence, within which slot portions to support turns of a coiled wire element on both sides of such transverse axis of symmetry, in combination with a substantially planar frame, means extending thereacross in parallel rows to support said plurality of insulators by their said inward support parts in a common plane defined by the planes of said insulators, and an electrical heating coil having terminal ends and being supported between said terminal ends by said insulators in such common plane in a pattern of parallel rows connected by 180° bends, such support being afforded at adjacent pairs of wire turns of the coil by their being positioned within said linear slot portions of the insulators, whereby the angular convergence of the slot portions requires a reverse twisting displacement, in such common plane, of the coil turns so supported, to permit their escape from a supporting insulator.

4,481,412

INTERACTIVE VIDEODISC TRAINING SYSTEM WITH BAR CODE ACCESS

Craig I. Fields, 2737 Devonshire Pl., Washington, D.C. 20008

Continuation-in-part of Ser. No. 390,403, Jun. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 341,456, Jan. 21, 1982, abandoned. This application Mar. 7, 1983, Ser. No. 473,022

Int. Cl.³ G06K 7/10

U.S. Cl. 235—472 **4 Claims**

1. An interactive training system with bar code access comprising a printed schematic representation having a printed index which has a set of associated bar codes each of which corresponds to a portion of the schematic and a unique set of items in the printed index related to said portion and further comprising:

a. bar code reading means for reading each of the set of associated bar codes of the printed index;

b. a videodisc player which stores information on a videodisc and which has a driving mechanism, which rotatively

drives said videodisc, and a first microprocessor, which receives mode inputs and address inputs; and

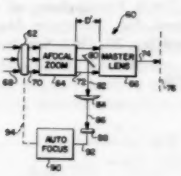
c. a second microprocessor which is electrically coupled to said bar code reading means from which said second microprocessor receives an input signal whereby said second microprocessor processes said input signal and generates a set of output signals, which are said mode inputs and said address inputs, wherein said second microprocessor is electrically coupled to said first microprocessor of said videodisc player so that said first microprocessor controls said driving mechanism as said driving mechanism rotatively drives said videodisc to positions where the particular set of items are stored on said videodisc in order to access the unique set of items stored within said videodisc which corresponds to a particular associated bar code and retrieve the particular set of items in a particular sequence or pace, said second microprocessor being also electrically coupled to said bar code reading means.

4,481,413

STRIP MIRROR RADIATION SPLITTER FOR RANGE DETERMINATION SYSTEMS

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1982, Ser. No. 393,939
Int. Cl.³ G01J 1/36; G03B 7/08
U.S. Cl. 250—204 **2 Claims**



1. Apparatus for use with a range finding system which includes a moveable lens operable to direct a beam of radiation from a remote object along a first optical path to an image plane, the beam having a cross-sectional area at a predetermined location along the first optical path and the system further including radiation detection means which comprises a pair of radiation detectors having a first area, the radiation detection means operable to provide an output indicative of the range to the remote object, the improvement comprising:

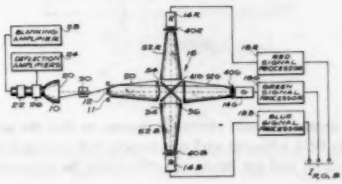
reflecting means comprising a single strip mirror having greater length than width mounted at the predetermined location and sized with the width smaller than the cross-sectional area so as to substantially, totally reflect only a predetermined portion of the radiation along a second optical path to the pair of radiation detectors, the reflected radiation falling on the detectors in substantially a rectangle where the length is great enough to extend over both detectors and where the width is less than the width of the detectors so that the radiation covers a second area on the detectors which is less than the first area.

4,481,414

LIGHT COLLECTION APPARATUS FOR A SCANNER

John Gasper, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1982, Ser. No. 348,373
Int. Cl.³ G01J 3/34
U.S. Cl. 250—226 **13 Claims**



1. Apparatus for scanning a transparent original with a light beam relative to an optical axis and for collecting the portion of the beam transmitted through said original wherein the direction of the light beam rays emerging from respective areas of the original varies with respect to the optical axis, said apparatus comprising:

means for generating a light beam;

means for supporting the transparent original in the path of the beam;

means for moving the light beam across at least one dimension of the transparent original;

an elongated tapered optical element having differently sized apertures at opposite ends thereof and a tapered reflecting surface therebetween;

means for separating at least one spectral component from the light beam; and

means for supporting said optical element on the optical axis between said original supporting means and said separating means with its smaller aperture adjacent said original supporting means to collect the light beam rays emerging from the transparent original, whereby its tapered surface is oriented to internally reflect at least some of the light beam rays toward the larger aperture such that the direction of the rays emerging from the larger aperture and striking said separating means vary less with respect to the optical axis than the direction of the rays emerging from the transparent original.

4,481,415

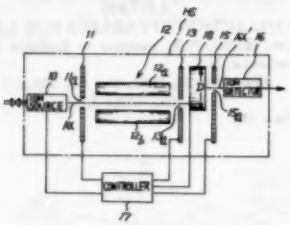
QUADRUPOLE MASS SPECTROMETER

Tsunezo Takeda, Nagaokakyo, and Kozo Miseki, Kyoto, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Oct. 27, 1982, Ser. No. 436,971
Int. Cl.³ B01D 55/44
U.S. Cl. 250—292 **9 Claims**

1. A quadrupole mass spectrometer comprising: an ion source for producing an ion beam of a sample to be analyzed; an analyzer including a quadrupole through which said ion beam passes; an ion detector having a central axis laterally displaced from the central axis of said quadrupole; means disposed adjacent the exit end of said quadrupole for defining an exit aperture for said ion beam to pass through, the central axis of said exit aperture being aligned with the central axis of said quadrupole; means disposed in front of said ion detector for defining an entrance aperture for said ion beam to pass through to enter said ion detector, the central axis of said entrance aperture being aligned with said central axis of said ion detector; electrode means disposed between said exit aperture defining means and said entrance aperture defining means

and having a through hole the central axis of which is in axial alignment with said central axis of said entrance aperture; and means for individually applying a voltage on said exit aperture



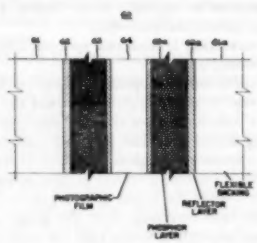
defining means and said electrode means, so that the action of a fringing field adjacent said quadrapole exit end and causing divergence of said ion beam can effectively be suppressed.

4,481,416

THERMOLUMINESCENT COACTIVATED RARE EARTH OXYHALIDE PHOSPHORS AND X-RAY IMAGE CONVERTERS UTILIZING SAID PHOSPHORS

Jacob G. Rabatin, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1982, Ser. No. 450,875
Int. Cl.³ G03C 5/16
U.S. Cl. 250—327.2 **37 Claims**



1. A radiographic imaging system which includes:

(a) a thermoluminescent layer of a phosphor having the general formula:

LnOX: A, B

wherein

X is one or more of La, Gd, and Lu,

X is one or more of F, Cl and Br,

A is a first activator selected from Bi and Sm providing the color of the light emission and

B is a second activator increasing the amount of stored energy in a radiographic latent image, said phosphor providing an improved light image substantially devoid of ghost image formation from said radiographic latent image,

(b) an x-ray source to expose said thermoluminescent layer to x-rays passing through an object to record said radiographic latent image on said medium,

(c) an energy source to recall said radiographic latent image as a light image thereof, and

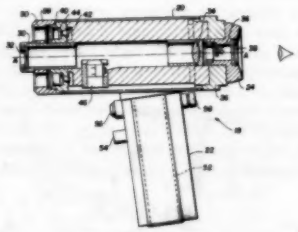
(d) photodetection means to read the light image.

4,481,417

INFRARED ENERGY DETECTION DEVICE

Clinton F. Inglee, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 22, 1982, Ser. No. 420,167
Int. Cl.³ G01J 1/00
U.S. Cl. 250—338 **9 Claims**



1. An infrared detection device for detecting the infrared energy emitted by an engine at varying torque settings, at a location remote from the engine, comprising:

detecting means for detecting the level of the infrared energy emitted by the engine and generating an electrical signal as a function of the level of the infrared energy emitted; and

indicating means including means for conditioning the indicating means for a given engine torque setting, to establish thereby an acceptable level of the infrared energy emitted for the given engine torque setting,

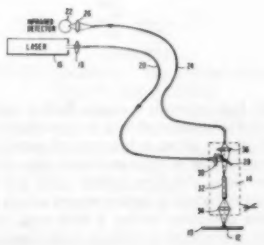
siad indicating means being connected to the detecting means for receiving the electrical signal generated by the detecting means and providing a visual indication of the level of the infrared energy detected and whether the infrared energy emitted for the given engine torque setting is above or below the acceptable level.

4,481,418

FIBER OPTIC SCANNING SYSTEM FOR LASER/THERMAL INSPECTION

Riccardo Vanzetti, Brockton; Ashod S. Dostoomian, Stoughton, and Alan C. Traub, Framingham, all of Mass., assignors to Vanzetti Systems, Inc., Stoughton, Mass.

Filed Sep. 30, 1982, Ser. No. 429,397
Int. Cl.³ G01J 1/00
U.S. Cl. 250—338 **5 Claims**



1. An apparatus for inspecting a device made up of a plurality of different infrared radiating elements comprising means for mounting said device in a fixed position, moveable head means adapted to be moved along orthogonal axes in close proximity to said device, laser beam means, optical fiber means connecting said laser beam means with said moveable head means for injecting thermal energy into said device and detection means operatively associated with said moveable head

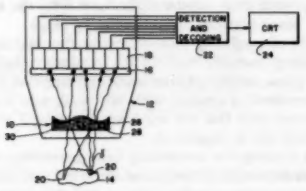
means for detecting infrared radiation emanating from said device.

4,481,419

ATTENUATION ZONE PLATE

Dennis E. Persyk, Barrington, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Oct. 29, 1981, Ser. No. 316,415
Int. Cl.³ G01T *1/164*; G21K *3/00*
U.S. Cl. 250—363 S **12 Claims**



1. An attenuation zone plate for use in a coded aperture imaging system to encode the distribution of a radiation source onto a detecting medium, comprising:

(a) a quantity of fluid radiation attenuating material;

(b) a radiation transmitting housing shaped as a fluid chamber to contain the fluid material in the configuration of a radiation attenuating pattern for modulating rays emitted from the radiation source according to their spatial origin; and

(c) means for selectively adjusting the shape of the fluid chamber as to vary the configuration of the pattern

wherein the fluid chamber is wedge-shaped and the adjusting means comprises means for varying the internal angle of the wedge.

8. A coded-aperture imaging system including a scintillation camera having a crystal; a plurality of photodetectors arranged to view overlapping areas of the crystal; an attenuation zone plate positioned between a source of radiation and the crystal to encode the distribution of the radiation from the source; detection and decoding circuitry for calculating the spatial distribution of a source of radiation based on the receipt of signals from the photodetectors in response to radiation impinging on the crystal from a source; the attenuation zone plate comprising a quantity of fluid radiation attenuating material and a radiation transmitting housing shaped to contain the fluid material in the configuration of a radiation attenuating pattern for modulating rays emitted from the radiation source according to their spatial orgin, wherein the fluid material is mercury and wherein the housing pattern comprises an attenuating wedge.

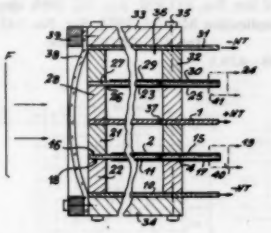
4,481,420

PROCESS FOR THE MANUFACTURING OF X-RAY DETECTORS FOR USE IN TOMOGRAPHY, RADIOGRAPHY, AND THE LIKE

Robert Allemand, Saint Ismier; Jean-Jacques Gagelin, Vinay, and Edmond Tournier, Grenoble, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 22, 1982, Ser. No. 370,614
Claims priority, application France, May 6, 1981, 81 09000
Int. Cl.³ G01T *1/185*
U.S. Cl. 250—385 **6 Claims**

1. Process for making an X-ray multidetector arranged to detect a plane beam of X-rays of small thickness, said multidetector comprising a tight chamber filled with an ionizable gas, and in this chamber, at least one main multidetector assembly comprising a plane conducting plate, electrically insulated from the chamber, parallel to the beam of X-rays and taken to a first level of potential, and a plurality of flat electrodes parallel to the plate, insulated from this plate, said electrodes being insulated from one another, taken to a second level of potential and extending in the direction of the rays furnished by the source, said process comprising the step of making the electrodes as well as main connections between these electrodes and points of measurement outside the chamber enabling the



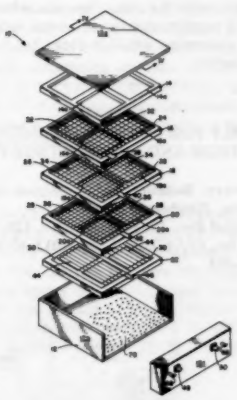
currents circulating respectively in these electrodes to be sampled, on a main face of an electrically insulating plate, these main connections being electrically insulated from the chamber and passing therethrough in tight manner, opposite the source which emits the X-rays.

4,481,421

LITHIUM-6 COATED WIRE MESH NEUTRON DETECTOR

Charles A. Young, San Diego, and Bruce D. Geelhood, La Mesa, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1982, Ser. No. 381,099
Int. Cl.³ H01J *47/12*
U.S. Cl. 250—390 **24 Claims**



6. A neutron detection apparatus comprising:

at least one sheet of meshed material, said meshed material being coated with a layer of lithium-6;

means comprising a gas, in contact with each of said sheets of lithium-6 coated mesh material, for generating electrons in response to charged particles radiated from said lithium-6 coated mesh material;

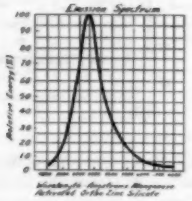
means for containing said gas means and each said sheet of meshed material in a closed volume; and

monitoring means in contact with said gas means for detecting the generation of electrons by said gas means.

4,481,422
INTRUSION DETECTING CAMOUFLAGE FLUORESCENT COATING

Arthur P. deMarco, Aberdeen, and Gerald E. Cook, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 832,870, Jun. 12, 1969, abandoned. This application May 21, 1971, Ser. No. 145,958
Int. Cl.³ G01N *21/64*
U.S. Cl. 250—459.1 **6 Claims**



1. A method of detecting an ambush comprising the spraying of a composition consisting of:

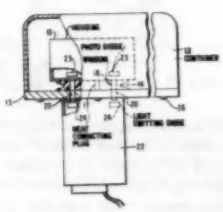
Ingredients	% by Weight
manganese activated ortho zinc silicate	52 to 54
pyrogenic colloidal silica	1 to 3
raw umber colorant	0 to 3
organic resin binder	8 to 15
hydrocarbon solvent	33 to 46

over a terrain in an amount of 0.49 to 3.90 grams of dry coating per square foot of terrain and subsequently subjecting the coated terrain to a detector light comprising multiple mercury vapor lamps which provide a short wave, non-visible ultraviolet radiation to excite the coated terrain, whereby the coated terrain emits a certain amount of visual radiation which is measured, to determine whether there has been any disturbance of the terrain.

4,481,423
ASSEMBLY FOR OPTICAL COMMUNICATION BETWEEN HIGH AND LOW VOLTAGE COMPONENT HOUSINGS

Harry E. Conway, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1981, Ser. No. 329,159
Int. Cl.³ G02B *27/00*; H01J *40/14*
U.S. Cl. 250—551 **4 Claims**



1. An assembly for optical communications between high voltage components within a sealed first housing and lower voltage components within a second housing, comprising:

a container enclosing the first housing and being constructed to contain fluid under pressure, said container having at least one removable metallic wall with a window sealed in an opening therein to permit light to pass therethrough, said metallic wall having a thickness greater than the thickness of the remaining container walls to dissipate heat generated by the first housing within the container,

a block of solid insulating material having upper and lower substantially parallel plane surfaces with a window sealed in a passage extending between the plane surfaces to permit light therethrough,

a plurality of spaced plugs of heat conducting electrical insulating material inserted in openings of said block having opposite ends substantially flush with the upper and lower plane surfaces of the insulating block,

said block of insulating material being attached to the heat dissipating metallic wall in the container such that its lower plane surface and the insulating plugs are in intimate heat conducting contact with said wall, said block being positioned such that the windows of the wall and insulating block are in alignment,

said first housing for containing heat generating electronic components and for being at an electrical potential greater than said container being connected to the removable wall and having at least one metallic wall with a plane outer surface and an opening therethrough, said first housing being insulatively fastened within the container such that its one metallic wall is in intimate heat conducting contact with the upper plane surface and insulating plugs of the insulating block to conduct heat from the first housing through the plugs to removable heat dissipating wall of the container, said first housing being positioned in the container to have its opening in registry with the windows of the container wall and insulating block,

a second housing for containing said lower voltage components having a wall of lesser peripheral dimension than the heat dissipating wall and having at least one opening therethrough, said second housing being attached exteriorly of the container to the heat dissipating metallic wall of the container in intimate contact therewith with its said opening aligned with the windows of the block and container and the opening in the first housing, and

first and second means mounted within the first and second housings respectively in optical alignment with the windows in the insulation block and with each other for light communication therebetween.

4,481,424
DRIVING MECHANISM FOR VEHICLE ENGINE AND ACCESSORY

Yoshiyuki Hattori, Toyoake, and Kazuma Matsui, Toyohashi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 5, 1982, Ser. No. 375,223
Claims priority, application Japan, May 7, 1981, 56/68952
Int. Cl.³ H02K *19/36*; F02N *11/00, 17/00*
U.S. Cl. 290—38 R **9 Claims**

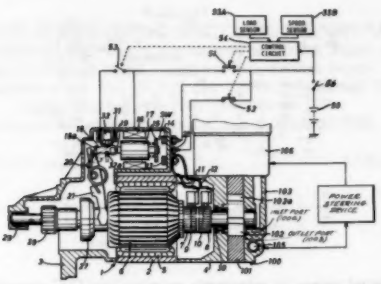
1. A driving mechanism for starting an internal combustion engine and driving an electrically driven accessory device such as a hydraulic pump, a pneumatic pump or the like under the control of an electric power applied thereto, comprising:

a starter motor assembly having an output shaft drivingly connected to said accessory device and arranged to be connected to said engine, said motor assembly being in the form of an armature type of double-layer winding whose first winding is designed to generate a high output torque on said output shaft upon energization thereof and whose second winding is designed to generate a low output torque on said output shaft upon energization thereof;

electrically operated actuator means for connecting said output shaft to said engine upon energization thereof and for disconnecting said output shaft from said engine upon deenergization thereof; and

an electric control apparatus for energizing the first winding of said armature and said actuator means to effect starting

of said engine and for deenergizing them after starting of said engine, said control apparatus being further arranged for energizing the second winding of said armature when



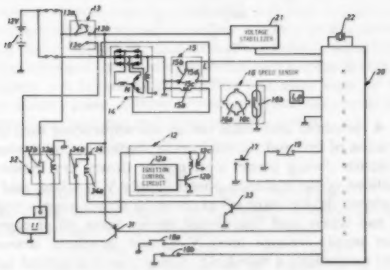
said accessory device is in its unloaded condition and for energizing the first winding of said armature when said accessory device is in its loaded condition.

4,481,425

AUTOMATIC CONTROL SYSTEM FOR PRIME MOVERS

Shinichi Hori, Anjo; Yasuichi Ohnishi, and Makoto Ono, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 19, 1982, Ser. No. 399,957
Claims priority, application Japan, Jul. 22, 1981, 56-114876
Int. Cl.³ F02N *17/00*; B60K *15/00*; H02P *9/04*; F02B *3/00*
U.S. Cl. 290—51 **5 Claims**



1. A control system for controlling the automatic stopping and restarting of a vehicle prime mover having a main switch associated therewith comprising:

user actuable setting means for providing a set signal for enabling automatic control; and

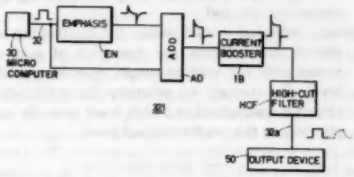
computer means, operable when said main switch is closed and responsiveto said set signal including (a) means for stopping said prime mover when said vehicle stops, (b) means for restarting said prime mover upon the occurrence of a predetermined condition, (c) means for maintaining the operation of said prime mover until the vehicle stops, (d) means for detecting whether said setting signal occurs after said main switch is closed and if so, performing the function of means (a)–(c) and if not, preventing theperformance of the functions of means (a)–(c).

4,481,426

SIGNAL TRANSMITTING SYSTEM HAVING SPURIOUS RADIATION PREVENTING FUNCTION

Katsuya Nakagawa, Osaka, and Satoshi Yamato, Shiga, both of Japan, assignors to Nintendo Co., Ltd., Osaka, Japan

Filed Dec. 20, 1982, Ser. No. 451,008
Int. Cl.³ H03K *5/00*; H04B *3/28*
U.S. Cl. 307—91 **4 Claims**



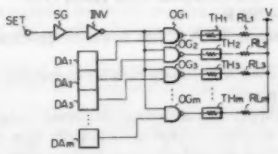
1. A system for transmitting a desired signal component of an original signal having relatively high frequency components from a signal source to a further device and for simultaneously preventing the transmission of undesired high frequency components, comprising signal line means for withdrawing said original signal from said signal source, emphasizing network means coupled to said signal line means for emphasizing undesired high frequency components of said original signal, signal attenuating circuit means operatively connected to said emphasizing network means for attenuating emphasized high frequency signal components from said emphasizing network means, wherein said emphasizing network means comprises means for producing an emphasized signal component based on said original signal, and means for adding, in a superimposed manner, said emphasized component from said emphasized component producing means to said original signal to form a superimposed signal, whereupon said attenuating circuit means remove the emphasized signal component from said superimposed signal and wherein said means for producing an emphasized signal component of said emphasizing network means comprises signal paths having different frequency response characteristics with respect to each other, at least one of said signal paths comprising amplifier means including an impedance circuit for providing different input impedances in accordance with different frequency components, said amplifier means including a feedback loop having a predetermined frequency response characteristic.

4,481,427

TTL CIRCUIT HAVING DELAY MEANS FOR DELAYING THE OPERATION UNTIL THE SUPPLY VOLTAGE REACHES A CERTAIN THRESHOLD

Hirokazu Suzuki, Yamato, and Takehiro Akiyama, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 29, 1982, Ser. No. 445,039
Claims priority, application Japan, Nov. 30, 1981, 56-192443
Int. Cl.³ H03K *19/003, 17/22, 19/088*
U.S. Cl. 307—200 A **5 Claims**



1. A transistor transistor logic (TTL) circuit operatively

connected to receive an external TTL signal and having a voltage supply, comprising:

an input circuit operatively connected to receive the external TTL signal, for producing an output signal;

an output circuit operatively connected to said input circuit;

means, operatively connected between said output circuit and said input circuit, for controlling said output circuit, said controlling means receiving the output signal from said input circuit and supplying a controlling signal to said output circuit; and

means, included in said means for controlling said output circuit, for delaying the operation of said controlling means until the voltage supply rises to a predetermined level after turning on, whereby the output of said TTL circuit is maintained at a high level until the voltage supply rises to the predetermined level.

4,481,428

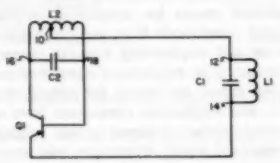
BATTERYLESS, PORTABLE, FREQUENCY DIVIDER USEFUL AS A TRANSPONDER OF ELECTROMAGNETIC RADIATION

Lincoln H. Charlot, Jr., Tampa, Fla., assignor to Security Tag Systems, Inc., Tampa, Fla.

Filed May 19, 1981, Ser. No. 265,149

Int. Cl.³ H01J *19/82*

U.S. Cl. 307—219.1 **17 Claims**



1. A frequency divider, comprising

a first circuit that is resonant at a first frequency for receiving electromagnetic radiation at the first frequency;

a second circuit that is resonant at a second frequency for transmitting electromagnetic energy at the second frequency; and

a semiconductor switching device having gain coupling the first and second circuits for causing the second circuit to transmit electromagnetic radiation at the second frequency solely in response to unrectified energy at the first frequency provided in the first circuit upon receipt of electromagnetic radiation at the first frequency.

4,481,429

BIAS SUPPLY FOR A.C. LINE POWERED APPARATUS

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 17, 1982, Ser. No. 379,094

Int. Cl.³ H03K *3/26;* **H04N** *3/18*

U.S. Cl. 307—296 R **10 Claims**

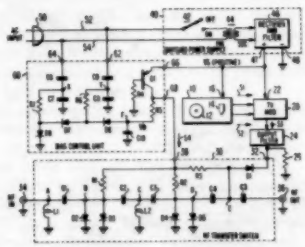
1. A bias supply for A.C. line powered apparatus, comprising:

first and second A.C. supply lines for connection to a source of A.C. power;

first D.C. supply means having transformer means having a primary winding coupled to said supply lines via a power on-off switch and output means for providing a first D.C. output voltage when said power switch is closed;

second capacitively coupled D.C. supply means having capacitor input means continuously coupled to said supply lines and output means for continuously providing a second D.C. output voltage;

an output terminal; and



circuit means for selectively coupling said D.C. output voltages to said output terminal to provide a bias output signal.

4,481,430

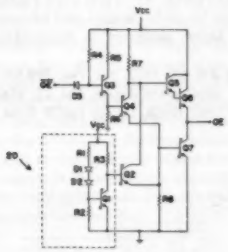
POWER SUPPLY THRESHOLD ACTIVATION CIRCUIT

William R. Houk, Westbrook, Me., and Hayagriva V. Rao, Fairchild, Conn., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Aug. 2, 1982, Ser. No. 404,318

Int. Cl.³ H03K *17/22, 17/30, 17/62, 19/007*

U.S. Cl. 307—296 R **20 Claims**



1. A threshold activation circuit for sequencing turn off or activation of first and second interdependent circuit devices of subcircuits during power out, power down, and power up transitions of the common power supply V_{cc}, where said second circuit device turns off at common power supply voltage V_{cc3} and where said first circuit device turns off at common power supply voltage level V_{cc2}, said threshold activation circuit comprising a threshold transistor and threshold ladder circuit coupled to the terminals of said threshold transistor, said threshold ladder circuit comprising collector resistor means coupled between the collector of said threshold transistor and the common power supply V_{cc}, diode clamping means and base supply resistor means coupled in series between the base of the threshold transistor and common power supply V_{cc}, base to ground resistor means coupled between said base and ground, the emitter of said threshold transistor being coupled to ground, and gate output means coupling the collector of said threshold transistor to the first circuit device, said threshold ladder circuit constructed and arranged for operatively maintaining activation of said first circuit device at a common power supply voltage level V_{cc1} and for maintaining activation of said first circuit device over a voltage range from V_{cc1} to at least a lesser common power supply voltage level V_{cc4}, said threshold ladder circuit comprising component values selected for operatively relating said common power supply voltage levels so that $V_{cc1} > V_{cc2}$ and $V_{cc3} > V_{cc4}$, whereby the se-

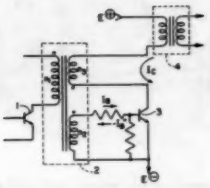
quence of turn off or activation of the circuit devices is controlled by the threshold activation circuit means.

4,481,431

CIRCUIT FOR DRIVING A SWITCHING TRANSISTOR

Hisao Nishino, and Shigeru Kondo, both of Sendai, Japan, assignors to Tohoku Metal Industries, Ltd., Sendai, Japan

Continuation of Ser. No. 338,119, Jan. 8, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 601,735
Claims priority, application Japan, Jan. 9, 1981, 56-1163
Int. Cl.³ H03K *17/60, 3/33*
U.S. Cl. 307—300 **8 Claims**



1. A circuit for driving a switching transistor comprising:

a pulse transformer for transmitting a switching pulse to said switching transistor, said pulse transformer having a primary winding to which the switching pulse is applied, a secondary winding and a third winding;

said switching transistor having a base and an emitter which are coupled with said secondary winding of said pulse transformer such that said switching transistor is turned on at a time when the switching pulse is applied to said primary winding; and

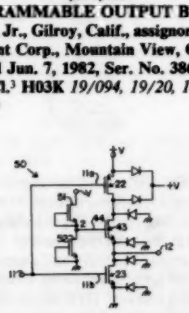
said third winding being connected in series with the collector-emitter path of said switching transistor and said third winding being wound in a direction relative to the winding direction of said secondary winding such that the current flowing through said switching transistor when it is in the on-condition flows through said third winding, the current flowing through said third winding inducing a current in said secondary winding which is inverse to a current induced in said secondary winding by the switching pulse applied to said primary winding, whereby a base-storaged carrier of said switching transistor is rapidly drawn out to said third winding just after lapse of the switching pulse without requiring additional circuit elements to draw out said base-storaged carrier.

4,481,432

PROGRAMMABLE OUTPUT BUFFER

Thomas J. Davies, Jr., Gilroy, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jun. 7, 1982, Ser. No. 386,125
Int. Cl.³ H03K *19/094, 19/20, 17/687*
U.S. Cl. 307—469 **3 Claims**



1. An output buffer circuit comprising:

a first P channel MOS transistor having a drain connected to a first potential, a gate connected to an input control signal, and a source;

a first N channel MOS transistor having a drain, a gate connected to said input control signal, and a source connected to a reference potential;

an output node connected to said drain of said first N channel MOS transistor;

a second N channel MOS transistor having a drain connected to said source of said first P channel MOS transistor, a source connected to said drain of said first N channel MOS transistor, and a gate connected to a programming terminal for receiving a programming voltage;

wherein a low programming voltage causes said second N channel MOS transistor to turn off, and thus when said input control signal is high, said first P channel transistor is off, said first N channel transistor is on, said output node has a potential substantially equal to said reference potential, thus providing a logical zero output signal; and thus when said input control signal is low, said first N channel transistor is off, said second N channel transistor is off, and said output node is isolated from said first potential and from said reference potential;

and

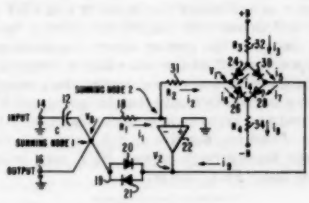
wherein a high programming voltage causes said second N channel transistor to turn on, and thus, when said input control signal is high, said first N channel MOS transistor is on, said first P channel MOS transistor is off, and thus said output node is thereby connected to said reference potential thus providing a logical zero output signal; conversely, when said input control signal is low, said first N channel MOS transistor is off, said first P channel MOS transistor is on, thus said output node is thereby connected to said first potential, thus providing a logical one output signal.

4,481,433

VOLTAGE CLAMP CIRCUIT UTILIZING AN ACTIVE DEVICE

Eldon M. Fisher, and Richard B. Elder, both of Acton, Mass., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 29, 1982, Ser. No. 402,903
Int. Cl.³ H03K *5/08*
U.S. Cl. 307—546 **4 Claims**



1. A clamp circuit connected between a circuit input terminal and a circuit output terminal comprising, in combination:

a capacitor connected between the circuit input and output terminals;

a high gain differential amplifier having a non-inverting input terminal referenced to circuit ground and an inverting input terminal resistively coupled to said circuit output terminal, said amplifier having an output terminal connection;

means providing a first selectively operable impedance between said circuit output terminal and said circuit ground, said first impedance being resistive, said means providing first impedance comprising means providing a first selectively operable feedback circuit path from said amplifier output terminal connection to said amplifier inverting input terminal, including biasing means for causing said feedback means to be operable when a signal applied at said circuit input terminal changes value by less than a

given amount dependent on the value of the bias of said biasing means and to otherwise be inoperable; and

means providing a second selectively operable impedance between said circuit output terminal and said circuit ground, said second impedance having a characteristic of a perfect diode conducting current into a perfect voltage source, said second means providing said second impedance comprising means providing a second selectively operable feedback path for feeding signals from said amplifier output terminal connection to said circuit output terminal and via said resistive coupling to said inverting input terminal;

said amplifier being responsive to said inoperable condition of said first feedback means for causing said second feedback means to be operable.

4,481,434

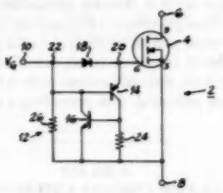
SELF REGENERATIVE FAST GATE TURN-OFF FET

William J. Janutka, West Allis, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,482

Int. Cl.³ H03K *17/04, 17/087*

U.S. Cl. 307—570 **9 Claims**



1. A fast turn-off FET circuit having drain, source and gate terminals, comprising:

an enhancement mode FET having a drain connected to said drain terminal, a source connected to said source terminal, and a gate operatively coupled to said gate terminal;

regenerative switch means connected to said FET gate and source and driven into latched conduction by residual stored charge in the gate to source capacitance of said FET upon turn-off of the latter due to removal of gate drive, said conduction of said regenerative switch means remaining latched ON until the charge on said FET gate is depleted to a given switching threshold, such that conduction of said regenerative switch means provides faster discharge therethrough of said FET gate, whereby to facilitate faster FET turn-off.

4,481,435

FIELD COIL TERMINAL CONNECTOR FOR STATOR ASSEMBLIES

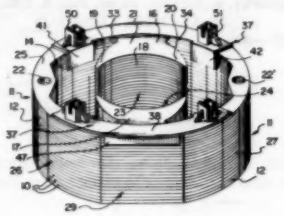
Leonard T. Loforese, Greenwich, Conn., assignor to Electrolux Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 229,915, Jan. 30, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 428,892

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—71 **6 Claims**

1. A terminal connector for use with a stator core of an electrical motor, the stator core having inner arcuate wall portions, and an outer wall having flat portions, a pole portion extending inwardly from the inner arcuate walls thereof and a field coil wound about the pole portion and having terminal ends, said terminal connector comprising: an elongated generally flat body portion having inner and outer arcuate walls and spaced ends; at least two depending lug means extending fixedly in one direction from said inner arcuate walls in spaced relationship with each other and being arcuately shaped so as to be complementary to the inner arcuate wall portions of the core on the opposite sides of the pole portion; exterior flange means including an elongated generally planar wall portion which is angularly disposed relative to said body portion and spaced from said inner wall of said body portion and depending fixedly in said one direction so as to meet said outer arcuate wall of said body portion at two points, said exterior flange means being disposed generally between said depending lug means adjacent said outer arcuate wall of said body portion in a position to engage the flat portion of the outer wall of the



stator core, said depending lug means and said exterior flange means being for cooperating with each other and with the stator core to frictionally and securely retain said terminal connector on the stator core adjacent to the pole portion of the stator core, and in a predetermined alignment relative to the stator core; and terminal well means disposed on said body portion adjacent each said end of said body portion, said terminal well means including means for receiving the terminals of the field coil.

4,481,436

ELECTRIC MOTOR, PROCESS FOR MOUNTING, AND WIRING SUBASSEMBLY

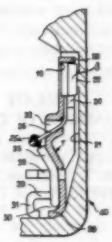
André Renaud, Fontenay le Fleury, and Henri Chauviere, Courbevoie, both of France, assignors to Etudes Techniques et Representations Industrielles E.T.R.I., Neuilly sur Seine, France

Filed Oct. 19, 1982, Ser. No. 435,310

Claims priority, application France, Oct. 23, 1981, 81 19893

Int. Cl.³ H02K *5/08, 11/00*

U.S. Cl. 310—71 **12 Claims**



1. An electric motor with radial air gap comprising a rotor (1), a stator (2) having a magnetic circuit (5) and two windings which form two winding heads (6) projecting with respect to the magnetic circuit at the axial ends thereof, a case (40) having an end wall (3) that extends radially and a sensor (8) for detecting the position of the rotor fixed on an electrically insulating disc (7) separating said end wall (3) from the winding heads (6), said sensor (8) being situated on the same side of said disc (7) as said wall, said disc (7) being applied and immobilized against said case (40), said sensor (8) having terminals (26) connected to connecting wires (25) which issue from the case (40) at a point remote from the connection point (25*a*) thereof with said terminals, and the internal face of the disc having guide means (28, 29, 30, 31) for leading the wires from one point to the other

while passing at a distance from the rotor (1) and the winding heads (6), said winding heads (6) being very close to the end wall (3), wherein said stator (2) is peripheral and said guide means cause the connecting wires (25) to pass into an annular space (27) about the winding heads (6), said two winding heads being separated by two diametrically opposite free spaces (23,24) and the outlet point of the wires facing one of said free spaces and the connecting point (25a) being in the other one of said free spaces.

4,481,437

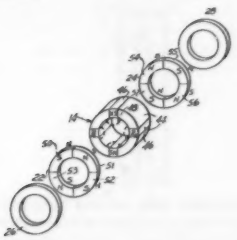
VARIABLE FLUX PERMANENT MAGNETS ELECTROMAGNETIC MACHINE

Rollin J. Parker, Greenville, Mich., assignor to Hitachi Metals International Ltd., White Plains, N.Y.

Continuation of Ser. No. 284,772, Jul. 20, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 500,317

Int. Cl.³ H02K *1/12*

U.S. Cl. 310—191 **11 Claims**



1. A rotating electro-magnetic machine comprising concentric stationary and rotating members, at least one first pair of permanent magnets disposed in one of said members for creating a first magnetic flux having a path external to said one of said members through a radial air gap into the other of said members, at least a second pair of permanent magnets disposed on one side of said first pair substantially linearly aligned with said first pair and angularly oriented relative to said first pair such as to create a second magnetic flux in addition to said first magnetic flux, at least a third pair of permanent magnets symmetrically disposed on the other side of said first pair substantially linearly aligned with said second pair and angularly oriented relative to said first and second pairs such as to create a third magnetic flux in addition to said first and second magnetic fluxes, and means for controllably angularly orienting said second and third pairs of magnets relative to said first pair for varying the strength of said first magnetic flux having said external path, wherein each of the magnets of said first pair are bar magnets having transversely aligned opposite polarities, and each of the magnets of said second and third pairs are ring magnets having longitudinally aligned opposite polarities.

4,481,438

HIGH VOLTAGE ELECTRICAL GENERATOR AND WINDINGS FOR USE THEREIN

Thomas A. Keim, Clifton Park, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 13, 1982, Ser. No. 417,657

Int. Cl.³ H02K *3/04*

U.S. Cl. 310—201 **4 Claims**

1. For use in a high voltage electrical generator, a multilayer winding comprising a plurality of half-turn helical modules, each of said modules comprising a plurality of half-turn bundles of conducting bars and sheet insulation means wrapped around said bundles, said bundles of conducting members interconnected to form complete turns of said winding, the innermost bundles of each of said modules are at highest voltage potential and the outermost bundles of each of said modules are of the lowest voltage potential, whereby a generally uniform progression exists between said outermost and said innermost bundles, the sheet insulation means wrapped about

said bundles providing insulation in approximate proportion to the voltage difference.

4,481,439

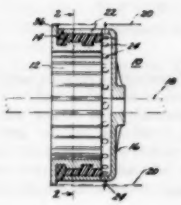
INVERTED MOLDED COMMUTATORS

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,130

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—233 **9 Claims**



1. An inverted commutator assembly for mounting on a rotor shaft in rotating electrical machinery of the type having stationary commutator brushes in wiping engagement with rotatable commutator segments, comprising:

a plurality of said rotatable commutator segments, each segment having a brush contact surface, said segments being circumferentially arranged in a spaced-apart relationship to one another in a ring about a longitudinal axis of rotation so that their brush contact surfaces face inwardly and define a cylindrical surface inside the ring;

a matrix of insulating material molded around the outside of the ring of segments and between the segments for electrically isolating the segments from one another and holding them in the ring configuration; and

means for affixing said plurality of commutator segments and said matrix to a rotatable shaft passing through said longitudinal axis of rotation.

4,481,440

PERMANENT MAGNET BRUSHLESS D-C MOTOR WITH ISOLATED SENSOR WINDING MEANS

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany

PCT No. PCT/EP80/00001, § 371 Date Sep. 17, 1980, § 102(e) Date Jul. 22, 1980, PCT Pub. No. WO80/01525, PCT Pub. Date Jul. 24, 1980

Continuation of Ser. No. 206,481, Sep. 17, 1980,. This PCT application Jan. 16, 1980, Ser. No. 481,268

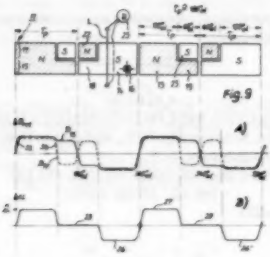
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2730142

Int. Cl.³ H02K *3/04*

U.S. Cl. 310—268 **29 Claims**

1. Brushless d-c motor having

a permanent magnet rotor, the poles of which have a non-sinusoidal magnetization, separated by pole gaps;
a stator, and an armature winding located in the stator;
means for pulse energizing the armature winding;
and a sensor winding positioned on the stator adjacent the armature to provide output signals induced in the sensor winding upon operation of the motor, representative of rotor position with respect to the sensor winding,
wherein the sensor winding includes a first portion having a first winding angle of 180°−el/L,
wherein L is the ordinal of a harmonic to be obtained from the sensor winding,



and then a second portion having the same average winding angle but wound in reverse direction to compensate for stray fields permeating the sensor winding, said sensor winding being positioned on the armature to provide output signals which are a harmonic or multiple of the base frequency induced in stationary conductors located on the stator upon rotation of the motor;
and wherein
the sensor winding has a winding pitch which is different from the pitch of the armature winding and comprises magnetically active portions which are located essentially intermediate neighboring magnetically active portions of the armature winding to avoid transformer coupling between the armature winding and the sensor winding.

4,481,441

METHOD OF MANUFACTURING A PICTURE DISPLAY TUBE HAVING A GAS-ABSORBING LAYER; PICTURE DISPLAY TUBE THUS MANUFACTURED, AND GETTERING DEVICE SUITABLE FOR SUCH A METHOD

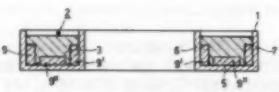
Wilhelmus A. van Gils, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 23, 1982, Ser. No. 351,574

Claims priority, application Netherlands, Mar. 24, 1981, 8101459

Int. Cl.³ H01J 9/20

U.S. Cl. 313—481 **21 Claims**



1. A method of manufacturing a picture display tube comprising positioning in the tube a gettering device including a metallic holder containing gas releasing material and an evaporable gettering metal, sealing and evacuating the tube, and inductively heating the device to effect coating of an inner surface of the tube with the gettering metal,
characterized in that the gas releasing material is placed against an inner wall of the metallic holder and is covered by the evaporable gettering metal, said gas releasing material being positioned in the metallic holder relative to the gettering metal to effect heating of the material to its gas-releasing temperature before the covering gettering metal is heated to its evaporation temperature.

4,481,442

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP, PARTICULARLY U-SHAPED FLUORESCENT LAMP, AND METHOD OF ITS MANUFACTURE

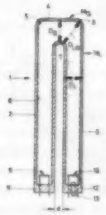
Wolfgang Albrecht, Berlin; Dieter Hofmann, Augsburg; Lutz Klein, Scheuring, and Ernst Panofski, Augsburg, all of Fed. Rep. of Germany, assignors to Patent Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,720

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112878

Int. Cl.³ H01J 63/04, 9/00

U.S. Cl. 313—493 **20 Claims**



1. A low-pressure mercury vapor discharge lamp having a discharge envelope (1; 15) formed of a single-piece glass tube bent at least once to define at least two straight, parallel longitudinal tube sections (2, 3; 16, 17, 18, 19) of essentially identical diameter dimensions (DL) and at least one transverse tube section (4; 20, 21, 22) connecting individual longitudinal tube sections;
a fluorescent coating on said longitudinal tube sections and on at least one transverse tube section;
the two outer ends of the discharge envelope being sealed and including electrodes sealed therein;
and a mercury-containing gas fill in said envelope,
wherein, in accordance with the invention,
the envelope is shaped and arranged to provide, in operation of the lamp, cold spots controlling the operating pressure of the fill in the envelope,
said envelope being formed and shaped to define an outer generating line M_Q of the individual transverse tube sections (4; 20, 21, 22) which is substantially straight;
a diameter D_{LQ} in the tube bends (5, 6; 23, 24, 25, 26, 27, 28) at the transition between the longitudinal tube sections (2, 3; 16, 17, 18, 19) and the respective transverse tube section (4; 20, 21, 22) which is larger than the diameter D_Q of the individual transverse tube section in the middle thereof,
and a diameter D_Q of the transverse tube section which is at least as large as the diameter D_L of the longitudinal tube sections.

4,481,443

SHORT-ARC DISCHARGE LAMP

Petrus J. Mathijssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1979, Ser. No. 31,647

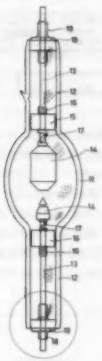
Claims priority, application Netherlands, May 23, 1978, 7805542

Int. Cl.³ H01J 63/30

U.S. Cl. 313—636 **2 Claims**

1. A short-arc discharge lamp having a sealed vacuum-tight quartz glass lamp envelope filled with a rare gas and compris-

ing a lamp envelope portion which encloses the discharge base and having first and second neck-shaped portions each having an inner bore, first and second tungsten electrode pins extending respectively through said first and second neck-shaped portions, first and second tungsten electrodes supported respectively on said first and second tungsten electrode pins, each electrode pin locally having a circumferential and axially extending glass coating, first and second annular glass members sealed to said coating between the axial extremities of said coating on respectively said first and second electrode pins,



said first and second annular glass members each having a circumferential surface in intimate contact with and sealed to said inner bore respectively of said first and second portions, said annular glass members each being annular glass bead-shaped members which do not extend radially beyond the extent of said inner bore cooperating therewith, said glass coating on said electrode pins and said annular glass bead-shaped member sealed thereto each having a coefficient of thermal expansion within the range of from 11 to 17×10^{-7} per degree C in the range from 30°to 800° C.

4,481,444

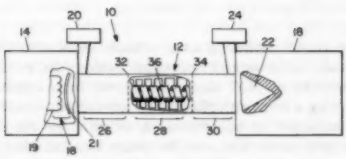
TRAVELING WAVE TUBES HAVING BACKWARD WAVE SUPPRESSOR DEVICES

Robert M. Phillips, Redwood City, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 246,835, Mar. 23, 1981, abandoned. This application Mar. 25, 1981, Ser. No. 247,452

Int. Cl.³ H01J *25/34*

U.S. Cl. 315—3.6 **51 Claims**



1. A traveling wave tube comprising:

(a) means for providing an electron beam directed along an axis, said electron beam traveling in a first direction;

(b) an electrically conductive slow wave structure including

(1) a helix disposed along and about said axis;

(2) tubular housing coaxially disposed about said helix; and

(3) a support structure for said helix;

(c) the pitch of said helix varying as a predetermined function of distance along said helix; and

(d) a preselected parameter of said support structure varying as a function of distance along said helix in a set relationship to said varying of said pitch of said helix such that for a first wave traveling along said slow wave structure having its phase velocity and group velocity along said first direction, the change in phase velocity caused by said varying of said pitch tends to cancel the change in phase velocity caused by said varying of said parameter of said support structure so as to result in a sufficiently uniform phase velocity as a function of distance along said slow wave structure to favor amplification of said first wave, whereas for a second wave traveling along said slow wave structure having its phase velocity along said first direction and its group velocity along the opposite direction, the change in phase velocity caused by said varying of said pitch is additive to the change in phase velocity caused by said varying of said parameter of said support structure so as to result in a sufficiently non-uniform phase velocity as a function of distance along said slow wave structure to suppress said second wave.

4,481,445

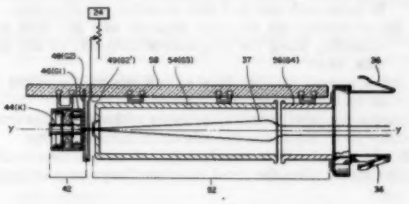
ELECTRON GUN FOR PROJECTION TELEVISION CATHODE RAY TUBES

Richard M. Gorski, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 1, 1982, Ser. No. 383,444

Int. Cl.³ H01J *29/46, 29/56*

U.S. Cl. 315—14 **4 Claims**



1. A high-performance bipotential-type electron gun comprising a series of electrodes aligned in spaced relation on an axis, having in the order named, lower end means including a cathode (K), and an apertured plate control electrode (G1), a grid electrode (G2), an entry angle control electrode (G2'), and a cylindrical electrode focus lens means including a focusing electrode (G3), and a final accelerating electrode (G4), said electron gun having the following approximate dimensions and spacings:

K–G1 spacing (cold)	0.007
G1 aperture diameter	0.025
G1 thickness, at aperture	0.007
G2 aperture diameter	0.036
G2 thickness, at aperture	0.006
G1–G2 spacing	0.007
G2' aperture diameter	0.054
G2' thickness at aperture	0.012
G2–G2' spacing	0.030
G2'–G3 spacing	0.030
G3 aperture diameter	0.065
G3 thickness at aperture	0.010
G3 axial length	1.75
G3 lens diameter	0.437
G3–G4 spacing	0.060
G4 axial length	0.70
G4 lens diameter	0.437
Gun length	2.60

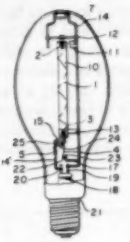
4,481,446
METAL VAPOR DISCHARGE LAMP

Michihiro Tsuchihashi; Katsuya Otani, and Ryo Suzuki, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 141,402, Apr. 18, 1980,. This application Aug. 12, 1982, Ser. No. 407,697

Int. Cl.³ H01J *7/44, 17/34, 19/78, 23/16*

U.S. Cl. 315—73 **10 Claims**



1. A metal vapor discharge lamp which comprises:

(a) an outer bulb;

(b) electric circuit means disposed in said outer bulb, said electric circuit means including;

(i) an arc tube;

(ii) a first heat-sensitive switch means connected in parallel with said arc tube;

(iii) heating means disposed adjacent said first heat-sensitive switch means, said heating means being connected in series with said first heat-sensitive switch means;

(iv) a starting aid disposed adjacent said arc tube and extending along the longitudinal direction of said arc tube; and

(v) a second heat-sensitive switch means connected in series with said starting aid; and

(c) a gas at a subatmospheric pressure within the range from 10^{-4} to 20 Torr sealed in said outer bulb, whereby:

(d) when electricity is initially supplied to said electric circuit means when the metal vapor discharge lamp is turned on:

(i) said heating means heats said first heat-sensitive switch means, causing said first heat-sensitive switch means to open and thereby causing a transitory voltage surge through said arc tube which initiates discharge of the lamp, and

(ii) said starting aid is energized, contributing to the initiation of the discharge of the lamp;

(e) after discharge of the lamp has begun:

(i) the heat generated by said arc tube heats said second heat-sensitive switch means, causing said second heat-sensitive switch means to open and thereby turning off said starting aid, and

(ii) the heat generated by said heating means and said arc tube insures that said first heat-sensitive switch means remains open during the discharge of the lamp; and

(f) the relatively low-vacuum gas present in said bulb moderates the transitory surge voltage which would be experienced by said arc tube if a conventional high vacuum were present in said outer bulb.

4,481,447
POWER SUPPLY FOR A MAGNETRON

Edward H. Stupp, Spring Valley, N.Y., and Mark W. Fellows, Monroe, Conn., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,107

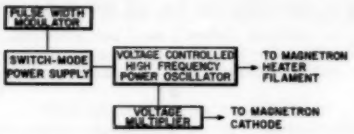
Int. Cl.³ H05B *39/00, 41/14*

U.S. Cl. 315—101 **10 Claims**

1. An electric power supply for a magnetron, said magnetron having a heater, a cathode, and an anode, and having a threshold voltage value between the anode and cathode above which electric current flows from the anode to the cathode, said power supply comprising:

power supply means for continuously supplying power to the heater; and

voltage supply means for continuously supplying a voltage across the anode and the cathode, said voltage varying



between a first value, which is substantially at or below the threshold voltage, and a second value, which is above the threshold voltage;

characterized in that the means for continuously supplying a voltage across the anode and the cathode comprises a voltage multiplier circuit having at least two stages, at least one but not all of which stages are switchably connected in the circuit.

4,481,448
AUTOMATIC ELECTRICAL MOTOR SPEED CONTROL

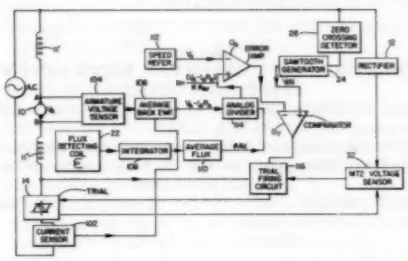
Malcolm J. Bishop, Oldham, England, assignor to Ferranti, PLC, Cheshire, England

Filed Jul. 1, 1983, Ser. No. 510,235

Claims priority, application United Kingdom, Jul. 17, 1982, 8220800

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—248 **6 Claims**



1. A system including an automatic speed controller for a universal, series-wound, electrical motor, the motor to be energised by an A.C. electrical supply, from control means comprising a triac with phase angle control, the control means being arranged to be controlled, in turn, by the automatic motor speed controller, and the system also including computing means having rectifying and filtering means, and responsive to input signals having a parameter the magnitudes of which are representative of instantaneous armature voltages v_a, input signals having a parameter the magnitudes of which are representative of instantaneous armature currents i_a, and input signals having a parameter the magnitudes of which are representative of instantaneous flux values in the magnetic circuit of the motor, in response to such input signals the computing means to derive signals, each such derived signal comprising a D.C. voltage having a magnitude which is at least substantially representative of the armature speed N, from the solution of the equation:

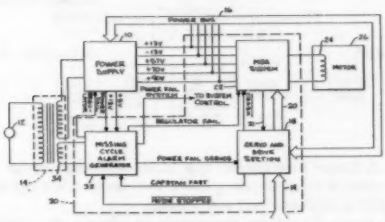
$$N = \frac{V_a - I_a R_a}{K \phi_{AV}},$$

where R_a is the resistance of the armature, K is a constant depending upon the motor design, and $(V_a - I_a R_a)$ is the true average of the alternating quality $(v_a - i_a R_a)$, and ϕ_{AV} is the true average flux value, the controller including means to compare each such derived signal with a reference signal provided by control-point-determining means of the controller, each reference signal having a parameter the magnitude of which is representative of a predetermined armature speed, in response to the comparing means detecting any difference between the armature speed represented by the derived signal and the predetermined armature speed represented by the reference signal, the comparing means provides an error signal, causing a control signal to be provided to the control means, and, in turn, there is caused to be supplied to the motor the required average of the A.C. electrical energy, the electrical energy to be supplied to the motor in each half cycle associated therewith to vary between consecutive half cycles, so as to tend to reduce any detected difference between the derived and the predetermined armature speeds.

4,481,449
POWER FAIL SERVO SYSTEM

David R. Rodal, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 1,287, Sep. 17, 1982,. This application Oct. 27, 1982, Ser. No. 436,904
Int. Cl.³ H02P *3/14, 3/18*
U.S. Cl. 318—375 **24 Claims**



1. A power fail circuit for controlling the deceleration of a tape in a tape transport apparatus, the tape being driven by a motor drive system powered by a source of power and having at least one electric motor driving a reel storing the tape, said motor drive system generating at least one electrical error signal indicative of deviations of the tape from a predetermined tape tension, the power fail circuit comprising:

monitor means for detecting a power failure in the source of power and responding to the power failure by generating a power fail signal,

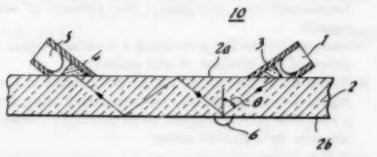
power supply interrupt means responsive to the power fail signal for selectively interrupting the supply of power to the motor to initiate dynamic braking using the energy in the motor in response to the generated electrical error signal; and

switching circuit means integral with the power supply interrupt means for the controlled application of dynamic braking to the electric motor by selectively interrupting the dynamic braking process at controlled intervals in response to said power fail signal and said electrical error signal, to maintain substantially the predetermined tape tension during stopping of the tape.

4,481,450
SYSTEM FOR CONTROLLING A VEHICLE WINDOW AND THE LIKE

Takashi Watanabe, Kariya; Yoshihiro Sasage, Aichi, and Hideaki Kato, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 29, 1983, Ser. No. 480,127
Claims priority, application Japan, Apr. 2, 1982, 57-55696
Int. Cl.³ H02P *1/04*
U.S. Cl. 318—444 **19 Claims**



1. A control system for a motor vehicle having a windshield, comprising:

first means mounted on the inner surface of said windshield at one end of a section thereof for emitting a beam of radiation into said windshield at an angle in the range between the critical angles of said windshield with respect to air and water to a normal to the windshield inner surface so that the beam totally internally reflects off the outer surface of the windshield in the absence of water on the windshield outer surface and partially reflects off said outer surface in the presence of water on the windshield outer surface;

second means mounted on the windshield inner surface at the other end of said section for detecting and converting said reflected beam into a first signal;

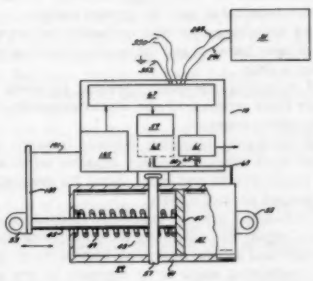
third means for comparing said first signal with a reference value to generate a second signal indicative of the presence of said water sufficient to warrant that a window of said vehicle be closed; and

fourth means, responsive to said second signal, for closing said window.

4,481,451
ELECTRONICALLY CONTROLLED POSITIONER FOR PNEUMATIC ACTUATORS

Thomas O. Kautz, Waukesha, and Gerald A. Duenkel, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 20, 1982, Ser. No. 410,085
Int. Cl.³ G05B *11/44*
U.S. Cl. 318—628 **6 Claims**



1. An electrically controlled positioner for pneumatic actuators including:

first means for selectively flowing compressed gas to an actuator;

valve means for selectively exhausting said compressed gas from said actuator;

analog electronic control panel means formed of solid state switching components and adapted to receive steady state binary signals at a pair of input terminals for responsively controlling said first means and said valve means, said binary signals being at a first polarity for flowing compressed gas to said actuator or at a second polarity for exhausting said gas from said actuator, said actuator being maintained in a position in the absence of said binary signals;

transducer means for generating a feedback signal representative of the position of said actuator;

said transducer means including a potentiometer for generating feedback signals, said potentiometer being actuated by a rotatable pulley adapted to be drivingly coupled to said actuator by a flexible cable;

said first means, said valve means and said panel means being pneumatically and electrically interconnected and disposed within a housing adapted to be readily mounted to said actuator.

4,481,452

CONTROL CIRCUIT FOR ELECTROMAGNETIC DEVICES

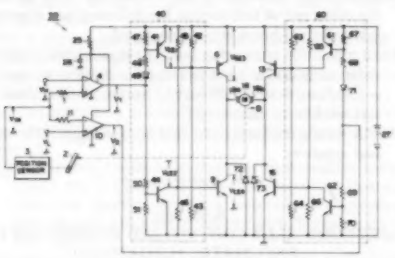
Yuichi Kitano, and Yoshiharu Tada, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 28, 1982, Ser. No. 382,936

Claims priority, application Japan, May 29, 1981, 56-81125

Int. Cl.³ G05F *1/08*

U.S. Cl. 318—681 **5 Claims**



1. A control circuit for an electromagnetic device, which controls the current supplied from a d.c. power source to the electromagnetic device in response to an input signal, comprising:

a first switching transistor provided between one power input terminal of said electromagnetic device and the positive terminal of said d.c. power source;

a second switching transistor provided between said one power input terminal and the negative terminal of said d.c. power source;

a third switching transistor provided between the other power input terminal of said electromagnetic device and said positive terminal;

a fourth switching transistor provide between said other power input terminal and said negative terminal;

means responsive to said input signal for generating a first and second control signals;

means including a first driving circuit responsive to said first control signal for controlling the conducting states of said first and said second switching transistors so as to cause said conducting states to be opposite to one another in such a way that one of said first and said second switching transistors is turned ON after the other is substantially turned OFF; wherein said first driving circuit has means including a first circuit substantially turning OFF said first switching transistor within the region where the level of said first control signal is less than a predetermined first level and a means including a second circuit for substantially turning OFF said second switching transistor within the region where the level of said first control signal is more than a predetermined second level which is less than said first level; and

means including a second driving circuit responsive to said second control signal for controlling the conducting states of said third and said fourth switching transistors so as to cause said conducting states to be opposite to one another in such a way that one of said third and said fourth switching transistors is turned ON after the other is substantially turned OFF; wherein said second driving circuit has means including a third circuit for substantially turning OFF said third switching transistor within the region where the level of said second control signal is less than a predetermined third level and means including a fourth circuit for substantially turning OFF said forth switching transistor within the region where the level of said second control signal is more than a predetermined fourth level which is less than said third level.

4,481,453

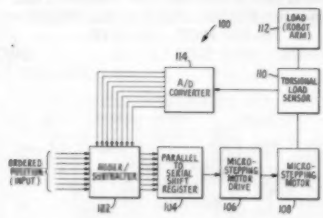
TORQUE LOOP CONTROL SYSTEM AND METHOD

Ross D. Welburn, Santa Rosa, Calif., assignor to Motornetics Corporation, Santa Rosa, Calif.

Filed Jul. 23, 1982, Ser. No. 401,106

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **6 Claims**



1. A torque loop control system for reducing angular position error in microstepping motor movement when the motor is under a torsional load comprising:

(a) means for sensing the torsional load on a microstepping motor and for producing an output signal indicative of the torsional load;

(b) combining means for receiving the output signal indicative of the torsional load on the microstepping motor and for summing it with an input signal indicative of a desired position of the microstepping motor, said means producing as an output signal a corrected position signal; and

(c) drive means responsive to the corrected position signal for driving the microstepping motor in accordance therewith.

4,481,454

METHOD OF DRIVING A STEPPING MOTOR

Yoshio Otani, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 500,230

Claims priority, application Japan, Jun. 7, 1982, 57-096232

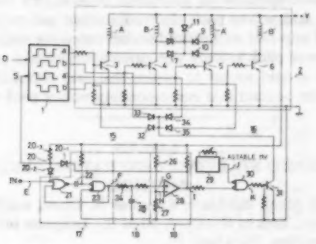
Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **1 Claim**

1. A method of driving a stepping motor having a plurality of phase windings from which one or more phase windings can be selected for passing intermittent currents therethrough to stop rotation of the stepping motor while exciting said selected

phase winding or windings, said method comprising the steps of:

(a) passing continuous currents through said selected phase winding or windings for an interval of time longer than the duration of each of said intermittent currents and shorter than the period in which a current flowing



through said phase winding or windings become saturated, while the stepping motor is being stopped in its rotation, and

(b) thereafter, passing currents successively through said plurality of phase windings starting with a phase winding or phase windings following said selected phase winding or windings.

4,481,455

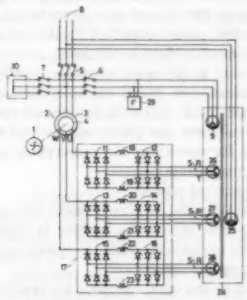
METHOD OF STARTING VARIABLE-SPEED INDUCTION MOTOR

Osamu Sugimoto, 2,4-2, Takanodai, Suita-shi, Ohsaka-fu; Shinobu Ishizaka, 2-6-94, Suimeidai, Kawanishi-shi, Ohsaka-fu; Youji Tanaka, 1-5-4-403, Nishinarusawa-cho, and Noboru Suzuki, 2-29-21, Nishinarusawa-cho, both of Hitachi, Ibaraki-ken, all of Japan

Filed Sep. 29, 1983, Ser. No. 536,871

Int. Cl.³ H02P *1/26*

U.S. Cl. 318—778 **2 Claims**



1. In a system consisting of a pump turbine, a variable-speed induction motor connected mechanically to the pump turbine to drive it, and a cycloconverter adapted to convert line frequency into any desired frequency so that the speed of said induction motor is controlled by varying a frequency output from said cycloconverter, a method of starting up said variable-speed induction motor comprising: applying the output from said cycloconverter to the secondary winding of said induction motor while the primary winding of said induction motor is short-circuited during the start-up of said induction motor; applying a voltage lower than the line voltage to said primary winding when said induction motor is operating at a speed within an intermediate speed range; and applying the line voltage to said primary winding when said induction motor is operating at a speed near its ranged speed.

4,481,456

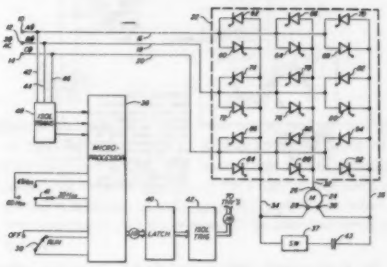
MICROPROCESSOR CONTROLLED MULTIFREQUENCY AC CONVERTER

Russell G. Meyerand, Jr., Glastonbury; Louis L. Daigle, and Donald C. Paine, both of Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 308,634, Oct. 5, 1981, abandoned. This application Jan. 24, 1983, Ser. No. 460,526

Int. Cl.³ H07P *5/40*

U.S. Cl. 318—800 **7 Claims**



1. A converter for transforming a three-phase, sinusoidal waveform of a first frequency directly to a lower frequency waveform having a substantially sinusoidal characteristic for operating an AC motor comprising:

input means from a source of electrical energy, for receiving electrical power having a plurality of phases;

switching means including a matrix having a plurality of switching elements connected between said source of electrical energy and said motor;

sensing means for monitoring the phase of the voltage waveforms from said source of electrical energy;

processing means for selectively operating said motor in a number of different speed modes, said processing means following a step-by-step program sequence to determine equality between selected phases of said three-phase sinusoidal waveform, and to generate control signals that enable each of said switching elements of said switching means at a predetermined time and in a particular sequence; and

whereby said converter presents said lower frequency waveform to said motor allowing operation at either full speed, three-quarter speed or half speed.

4,481,457

METHOD FOR PROVIDING ADAPTIVE CONTROL OF VARIABLE SPEED AC MOTOR DRIVES

Franz C. Zach, Vienna, Austria; Bimal K. Bose, Latham, N.Y.; Paul M. Espelage, Salem, Va., and John S. Sicko, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 241,315, Mar. 6, 1981, Pat. No. 4,387,421. This application Nov. 10, 1982, Ser. No. 440,780

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—803 **3 Claims**

1. A method of controlling an alternating current multiphase machine drive system comprising the steps of:

generating a sinusoidal reference current signal for each phase;

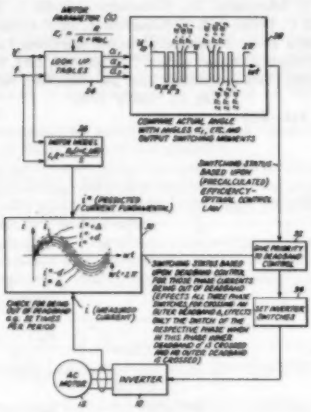
generating signals representative of actual machine currents for each phase;

comparing actual machine current signals in each phase to a

deadband of greater and lesser magnitude than the sinusoidal reference current for that phase;

determining the fundamental frequency of the sinusoidal reference current signal;

varying the width of the deadband surrounding each phase of the sinusoidal reference current signal, dependent on



the fundamental frequency of the sinusoidal reference current so that at increasing frequencies the width of the deadband increases; and

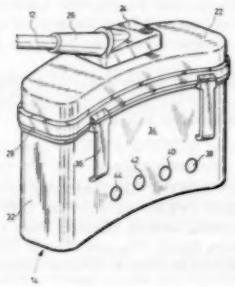
generating inverter switching signals, responsive to the actual machine current signal in a particular phase extending outside the deadband, to control a corresponding phase of an inverter.

4,481,458

MINERS LAMP POWER PACK

Kerry S. Lane, Newmarket, Canada, assignor to Levitt-Safety Limited, Toronto, Canada

Filed Apr. 11, 1983, Ser. No. 483,441
Int. Cl.³ H02J 7/00
U.S. Cl. 320—2 **23 Claims**



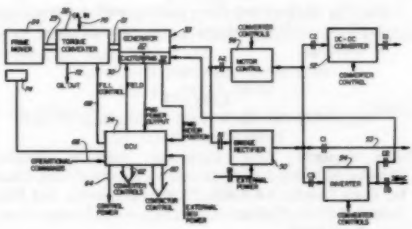
1. In combination, a rechargeable dry cell power pack with a lamp and recharging device for said dry cell power packs, said recharging device comprising a socket for receiving at least a lower portion of said power pack, a plurality of electrodes being presented in said socket and so arranged to contact corresponding electrodes on said power pack when fully inserted in said socket, said lamp being electrically connected to said power pack by a length of electrical wiring, means provided on said recharger device for holding said lamp accompanying said power pack while said power pack is in place in the socket of said recharger, said power pack being curved slightly to conform to a user's hip when in use, said power pack electrodes being positioned in an inner face portion of said power pack so as to be adjacent a user's hip when in use, said socket having a corresponding shape to receive at least said lower portion of said power pack, said socket having correspondingly curved opposing first and second faces, said socket electrodes being positioned on said first face so as to contact said power pack electrodes when said power pack is inserted into said socket, said socket receiving and supporting said power pack in only one orientation of said power pack relative to said socket to ensure that said plurality of socket electrodes contact said corresponding power pack electrodes.

4,481,459

COMBINED STARTING/GENERATING SYSTEM AND METHOD

Byron R. Mehl, Belvidere; Raymond N. Olson, and Timothy F. Glennon, both of Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 20, 1983, Ser. No. 563,449
Int. Cl.³ F02N 11/04, 11/08
U.S. Cl. 322—10 **14 Claims**



1. In a power conversion system operable in either a starting mode wherein the conversion system converts electrical power into motive power to start a prime mover or in a generating mode wherein the conversion system develops electrical power from motive power supplied by the prime mover including a main dynamoelectric machine, means actuable to supply field current to the main machine including a permanent magnet generator, or PMG, the main machine and PMG having a common rotor, and a torque converter operable to transfer power between the prime mover and the common rotor, a control for operating the conversion system in the starting mode, comprising:

a source of electrical power;

means for coupling the source of electrical power to the PMG when the conversion system is operated in the starting mode to cause the PMG to operate as a motor and drive the common rotor;

means coupled to the main machine for applying electrical power thereto to cause the main machine to operate as a synchronous motor when a predetermined operating condition of the main machine is attained;

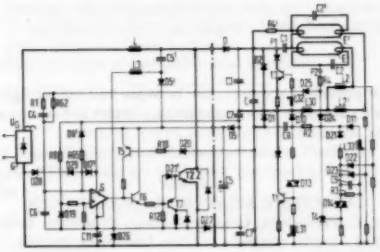
means for disconnecting the source of electrical power from the PMG after the predetermined operating condition is attained; and

means coupled to the torque converter and responsive to an operating parameter of the main machine for controlling the torque converter including means for disabling the torque converter to decouple the main machine from the prime mover until the predetermined operating condition is attained and means for enabling the torque converter to couple the main machine to the prime mover to start the latter when the main machine is operated as the synchronous motor.

4,481,460
INVERTER WITH CHARGING REGULATOR HAVING A VARIABLE KEYING RATIO

Armin Kröning, Seebruck; Max Kerscher, Chieming, and Peter Krummel, St. Georgen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & MUnich, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,585
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204225; May 28, 1982, 3220301
Int. Cl.³ H02P 13/16; H05B 41/29
U.S. Cl. 323—266 7 Claims



1. An inverter for use with a DC voltage source which delivers an unsmoothed half-wave voltage, comprising: a charging regulator having a charging capacitor connected through a charging diode and a charging inductor to said DC voltage source; a charging switch connected to the inductor; means for periodically closing the charging switch with a variable keying ratio V dependent upon a control magnitude of a control component to switch said charging inductor to the DC voltage source; a converter having two alternating control switches supplied by said charging capacitor, said two switches being a primary switch and a secondary switch connected in a series circuit parallel to said charging capacitor; means for synchronizing said control component for the charging switch by a square wave voltage on one of said primary and secondary switches such that the charging switch is closed upon blocking of one of said primary or secondary switches and, after a time period determined by a charge of a delay storage element to a certain operating value, said charging switch is blocked; and a discharge circuit of the delay storage element being conducted via said one primary or secondary switch where blocking was initially sensed.

4,481,461
SWITCHING REGULATOR

Rihei Hiramatsu, Tokyo; Ko Takeshita, Kanagawa, and Tokunari Inoue, Tokyo, all of Japan, assignors to Densetsukiki Industry Co., Ltd., Tokyo, Japan

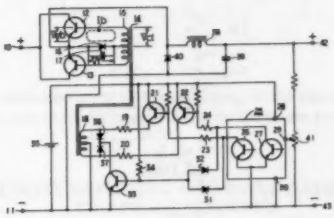
Filed Sep. 30, 1982, Ser. No. 430,064
Claims priority, application Japan, Oct. 23, 1982, 56-169876
Int. Cl.³ G05F 1/46
U.S. Cl. 323—272 7 Claims

1. A switching regulator, comprising:

a main circuit having a smoothing reactor, a smoothing condenser and a commutation diode and a switching main transistor means operatively associated therewith for providing an output voltage, said switching main transistor means comprising at least two switching main transistors connected in parallel with each other;

a control circuit operable to detect and amplify the output voltage of said main circuit for controlling conduction and nonconduction of said main transistor means, said control circuit including two transistors having respective periods of nonconduction wherein a period of nonconduction of one said control circuit transistor overlaps in time with a period of nonconduction of the other said control circuit transistor, said control circuit transistors having output means for producing pulses alternately at a phase difference of 180°;

a current transformer having a primary winding and a secondary winding, said secondary winding and a diode and condenser being connected between the base and emitter of a said switching main transistor; and

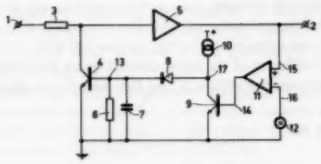


means connecting said two transistors of said control circuit to the respective ends of said primary winding of said current transformer, said connecting means including a switching element connected for shorting said ends of the primary winding of said current transformer when said two control circuit transistors are nonconductive simultaneously.

4,481,462
AMPLITUDE CONTROL SYSTEM

Albertus J. de Kleijn, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,274
Claims priority, application Netherlands, Dec. 17, 1981, 8105688
Int. Cl.³ G05F 1/48; H03K 5/01
U.S. Cl. 323—274 2 Claims



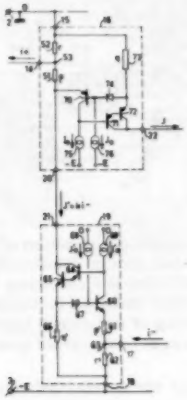
1. An amplitude control system comprising, a series arrangement of a resistor and an amplifier connected between an input and an output of the system, means connecting an input of the amplifier to a point of constant potential via the main current path of a transistor, means connecting a control electrode of the transistor to an integrator and to the output of the control system via a control loop, wherein the control loop comprises a current source connected to the control electrode of the transistor via a first switching element and also being connected to a point of constant potential via a second switching element, means connecting the output of the system to one input of a comparator whose other input is connected to a source of reference voltage, the output voltage of the comparator controlling the first and second switching elements such that the first switching element is closed and the second switching element is opened when the voltage on the one input of the comparator is higher than the voltage on the other input, the first switching element being opened and the second switching element being closed when the voltage on the one input of the comparator is lower than the voltage of the other input.

4,481,463

CURRENT MIRROR CIRCUIT

Gilbert M. M. Ferrieu, Bievres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 159,732, Jun. 16, 1980, Pat. No. 4,356,354. This application May 3, 1982, Ser. No. 374,123
Claims priority, application France, Jun. 25, 1979, 79 16261
Int. Cl.³ G05F *3/08*
U.S. Cl. 323—315 **8 Claims**



1. A circuit for weighting an input current with a specific coefficient comprising a first transistor whose emitter is coupled to a power supply terminal via a first resistor, of which one end is connected to the input terminal of said circuit and of which the other end is connected to said power supply terminal, the collector of said first transistor being energized by a current source and its base being connected to a current source and to a diode which is connected to the emitter of a single or composite second transistor, whose emitter is connected to said power supply terminal via a second resistor, whose base is connected to the collector of said first transistor, and whose collector is connected to the output terminal of said circuit, the weighting coefficient of the input current being determined by the ratio between the values of the first and the second resistors.

4,481,464

APPARATUS FOR MEASURING TIME VARIANT DEVICE IMPEDANCE

Hitoshi Noguchi; Tomoyuki Akiyama; Hideo Akama; Hideo Okara, Japan, and Hisao Yoshino, all of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 20, 1982, Ser. No. 435,437
Claims priority, application Japan, Oct. 30, 1981, 56-173854
Int. Cl.³ G01R *27/00*
U.S. Cl. 324—57 PS **6 Claims**

1. An apparatus for measuring the impedance of an element, said apparatus comprising:

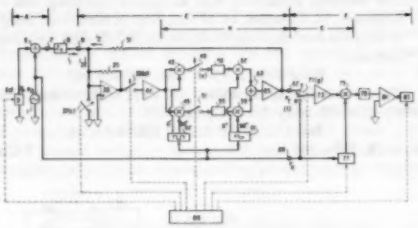
input means for applying a measuring signal to said element;

a current to voltage conversion means having a sampling integration type modulation amplifier for sampling a current flowing therethrough in a plurality of predetermined periods for integration and for converting the current flowing through said element into a voltage; and

a vector voltage ratio measurement means having

first means for selectively introducing the output signal of said current to voltage conversion circuit or said measuring signal, and

second means for effecting an AC to DC conversion on said signals through phase detection



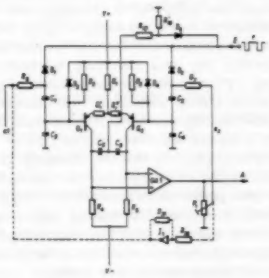
for providing a vector ratio between said output signal of said current to voltage conversion circuit and said measuring signal.

4,481,465

CAPACITIVE MEASURING TRANSDUCER

George E. Fredericks, Graz, and Horst Preschern, Leibnitz, both of Austria, assignors to Hans List, Graz, Austria

PCT No. PCT/AT80/00027, § 371 Date Mar. 27, 1981, § 102(e) Date Mar. 27, 1981, PCT Pub. No. WO81/00620, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 18, 1980, Ser. No. 247,294
Claims priority, application Austria, Aug. 29, 1979, 5774/79
Int. Cl.³ G01R *11/52, 27/26*
U.S. Cl. 324—60 CD **7 Claims**



1. A capacitive measuring circuit, comprising:

first and second bridge arms each including at least one capacitor;

a differential amplifier having an input connected to each of said bridge arms and an output fed back to at least one of said first or second bridge arms;

a common oscillator being connected to said first and second bridge arms via one switching element each, each said switching element having two terminals, one terminal being connected to said oscillator and the other one to said respective bridge arm, said oscillator having an output for providing a rectangular pulse train voltage to said switching elements;

a number of potential sources;

a first passive circuit element for connecting one of said potential sources to a respective one of said first and second bridge arms, said potential source being connected to the other terminal of said switching element connected to said bridge arm;

a second passive circuit element for connecting a second potential source to the other of said two bridge arms, said second potential source being connected to the other

terminal of said switching element connected to said other of said two bridge arms;

the rectangular pulse train applied to said switching elements connected to said bridge arms oscillates between a potential higher and a potential lower than said potentials applied to said capacitors of said bridge arms from said potential sources via said passive circuit elements shifted by the amount of the passing through voltage of said switching elements to allow said capacitors to be charged and discharged alternately whereby the duration of the pulses and intervals of the pulse train allows that the charging current of the capacitors drops practically to zero;

a feedback circuit including only second passive circuit elements only connected with at least one capacitor of one of said two bridge arms via one of said first and second passive elements and

with the output of said differential amplifier.

4,481,466

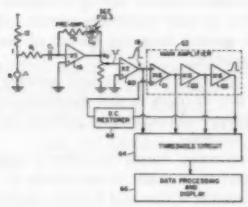
PULSE AMPLIFYING SYSTEM

Ermi Roos, Hialeah, and Robert L. Talbert, Pembroke Pines, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Nov. 3, 1980, Ser. No. 203,122

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71.1 **25 Claims**



14. In particle analyzing apparatus wherein particles traverse on aperture resistance and through which flows a constant current wherein the variation of aperture resistance through which said constant current flows represents a signal voltage pulse, an amplifier having its input coupled through a d.c. blocking capacitor to said aperture resistance in a series arrangement, a feedback path of fixed resistor and an effective variable capacitor coupled between the output and the input of said amplifier, and means including a negative feedback servo system for varying the value of said variable capacitor in such direction that the gain of said amplifier is independent of the frequency of the input voltage pulses.

4,481,467

BREAK-AWAY TEST PROBE

John B. Alexandersen, East Windsor Township, Mercer County, and Ivan J. Karolik, Plainsboro, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,251

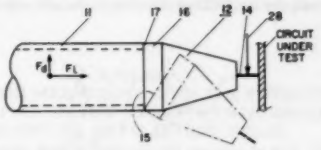
Int. Cl.³ G01R *1/06*

U.S. Cl. 324—72.5 **8 Claims**

1. A test probe for testing electrical circuits mounted on a circuit board comprising:

an elongated arm extending substantially along a longitudinal direction; and

a probe head having at one end thereof at least one probe pin and having the other end breakably coupled to one end of the elongated arm such that said probe head and said arm are magnetically coupled in substantial alignment along said longitudinal direction, and are breakably uncouplable away from each other in directions away from said longitudinal direction, whereby said at least one probe pin may



be deflected prior to any damaging of the circuit board, the electrical circuit under test, or the probe pin.

4,481,468

VELOCITY DETECTING APPARATUS HAVING A TWO-PHASE RESOLVER

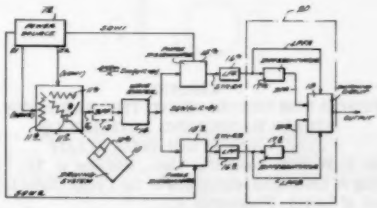
Tadahiro Ono, and Naoshi Miura, both of Shizuoka, Japan, assignors to Toshiba Kikai Kabushiki Kaisha and Toei Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,525

Claims priority, application Japan, May 14, 1981, 56-72720; May 14, 1981, 56-72719

Int. Cl.³ G01P *3/46, 13/00, 3/52*

U.S. Cl. 324—163 **22 Claims**



1. A velocity detecting apparatus which comprises:

a two phase resolver having a primary and secondary winding and a rotor adapted to be connected to means for driving said rotor;

means for exciting the primary windings of said resolver;

wave shaping means for producing a square wave of the same period and phase as the output signal given by the secondary windings of said resolver;

phase discriminating means for rectifying the output signal of said wave shaping means;

low pass filter means for producing a triangular wave from the output signal of said phase discriminating means;

means for producing a signal corresponding to the absolute value of the slope of said triangular wave and indicating the velocity of said rotor.

4,481,469

ROTARY SPEED SENSOR WITH HALL GENERATOR RESPONDING TO TANGENTIAL COMPONENT OF MAGNETIC FIELD

Peter Hauler, Karlsruhe; Manfred Rothley, Kraichtal, and Erich Zabler, Stutensee, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 11, 1982, Ser. No. 377,026

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122376

Int. Cl.³ G01P *3/48, 3/54*

U.S. Cl. 324—174 **18 Claims**

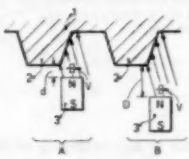
1. Rotary speed sensor system having

a toothed rotary element (1) of magnetic material, rotatable

about an axis of rotation, in which the teeth have faces inclined with respect to radial lines intersecting the axis;

a magnetic field responsive sensor (4);

and means (3) to generate a magnetic field which includes both the teeth (2) of the rotary element and the sensor,



wherein, in accordance with the invention,

the sensor (4) is a field-dependent sensor and oriented and arranged relative to the field generated by the field generation means to respond to the tangential components of the magnetic field as the teeth (2) pass the sensor.

4,481,470

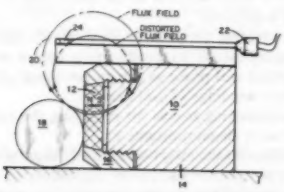
METHOD FOR DETERMINING THE HARDNESS OF STRAIN HARDENING ARTICLES OF TUNGSTEN-NICKEL-IRON ALLOY

Steven A. Wallace, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 29, 1981, Ser. No. 287,966

Int. Cl.³ G01R *33/12*; G01N *27/72*

U.S. Cl. 324—228 **2 Claims**



1. A method for measuring the extent of cross-sectional strain hardening along the length of an elongated cold-worked article formed of tungsten-nickel-iron alloy, consisting of the steps of passing the article through a magnetic field emanating from a permanent magnet to saturate a cross-sectional portion of the article with magnetic flux, measuring the magnetic flux emanating from the article to determine the extent of the distortion in the magnetic field due to the presence of the cross-sectional portion of the article therein with the extent of distortion being indicative of and increasing with the degree of strain hardening through the cross-sectional portion of the article within the magnetic field, and comparing the measurements of magnetic flux taken along the length of the article with measurements of magnetic flux taken from a standard of the alloy of known cross-sectional hardness and of a similar configuration to provide measurements of cross-sectional hardness through cross sections of the article along the length thereof.

4,481,471

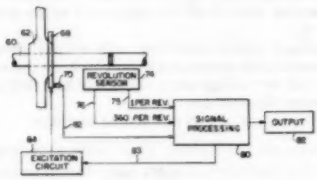
METHOD AND APPARATUS FOR THE DETECTION OF ANOMALIES IN ROTATING MEMBERS

Robert C. Miller, Penn Hills, and Walter J. Carr, Jr., Wilkins, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1981, Ser. No. 292,973

Int. Cl.³ G01N *27/82*

U.S. Cl. 324—240 **20 Claims**



1. Apparatus for detecting anomalies in an electrically conducting rotating member comprising:

(A) current conducting means contiguous said rotating member operable to establish a circumferential alternating eddy current therein, and a corresponding external magnetic field, as said member rotates;

(B) means for providing said current conducting means with an AC excitation current having a frequency f;

(C) the period of said excitation current being orders of magnitude greater than the period of rotation of said rotating member;

(D) sensing means contiguous said rotating member for detecting any changes in said magnetic field caused by said anomalies and operable to provide an output signal indicative thereof;

(E) signal processing means operable in response to said output signal to provide an indication of anomaly and anomaly location within said rotating member.

4,481,472

PULSED INDUCTION LOGGING FOR DETERMINING CONDUCTIVITY AND INVADED ZONE PROPERTIES

Stanley Gianzero, Austin, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Aug. 19, 1981, Ser. No. 294,124

Int. Cl.³ G01V *3/28*

U.S. Cl. 324—339 **23 Claims**

1. Apparatus for measuring the conductivity of earth formations surrounding a borehole, comprising:

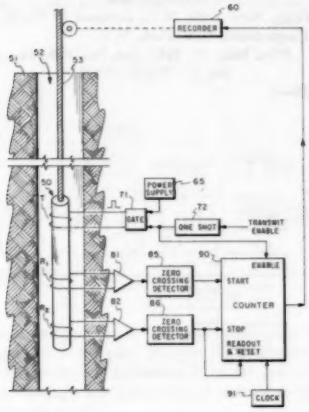
a logging device movable through the borehole;

a transmitter coil and first and second spaced receiver coils spaced from said transmitter coil, all mounted on said logging device;

means for applying a pulse of electrical energy to said transmitter coil;

means for detecting signals induced in said first and second receiver coils; and

means for determining the conductivity of the surrounding formation as a function of the times of occurrence of



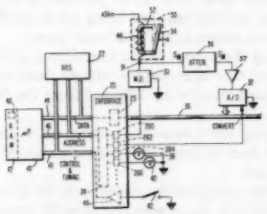
zero-crossings of the signals detected in said first and second receiver coils.

4,481,473

ELECTROMAGNET DROP TIME DETECTION METHOD

John I. Compton, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,146
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—423 **6 Claims**



1. A method for evaluating the release characteristics of an electromagnet having an armature biased to a first position and moveable to a second position responsive to electrical potential applied across a coil of said electromagnet, said method comprising:

connecting said coil with an electrical potential thereacross to move said armature to said second position;

disconnecting said coil from said electrical potential while said armature is at said second position;

supplying a test voltage related to the potential difference appearing across said coil to an analog-to-digital converter;

sampling said test voltage with said analog-to-digital converter at regular intervals to produce a series of digital signals indicative of the instantaneous voltage waveform across said coil;

storing said samples sequentially in a data storage device for a time period preselected to exceed the maximum expected release time for said electromagnet;

examining the stored samples from said storage device in reverse sequential order to identify a sample that indicates a magnitude shift relative to a predefined voltage level corresponding to a release of said armature to said first position; and

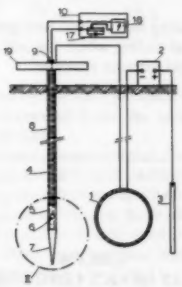
establishing a release time for said electromagnet based on the position of said identified sample in said sequence of samples.

4,481,474

DEVICE FOR MEASUREMENT OF THE POTENTIAL WITH RESPECT TO THE SOIL OF A CATHODICALLY PROTECTED METALLIC STRUCTURE

Woudstra Gerrit, Roden, Netherlands, assignor to N.V. Nederlandse Gasunie, Groningen, Netherlands

Filed Oct. 20, 1981, Ser. No. 312,986
Claims priority, application Netherlands, Jun. 26, 1981, 8103088
Int. Cl.³ G01N *27/42*
U.S. Cl. 324—425 **5 Claims**



1. A measuring device for measuring the potential, relative to the earth, of a metallic structure at least partially buried in said earth and cathodically protected by an externally applied DC voltage, comprising in combination:

a metallic, rod-shaped probe, having one end provided with an essentially conical tip for being driven into said earth, and having a major portion of the surface of said probe coated with an electrically insulating material, and a minor portion of said surface, near said one end, not coated with said insulating material, said uncoated portion constituting a measuring electrode;

a dry reference electrode consisting of (a) a material selected from the group consisting of zinc-plaster of Paris and (b) plaster of Paris/copper sulfateplaster of Paris, situated in a transverse bore in the rod-shaped probe near one end, and electrically insulated from said probe;

said measuring device having means for electrically connecting said measuring electrode to said metallic structure, and means for electrically connecting said measuring electrode and said reference electrode to a measuring circuit for measuring the potential difference between said measuring and reference electrodes.

4,481,475

BETATRON ACCELERATOR HAVING HIGH RATIO OF BUDKER PARAMETER TO RELATIVISTIC FACTOR

Christos A. Kapetanakos, Bethesda, and Phillip Sprangle, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

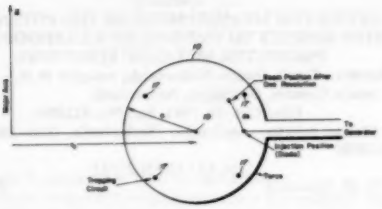
Filed Aug. 5, 1982, Ser. No. 405,465
Int. Cl.³ H05H *11/00*
U.S. Cl. 328—237 **19 Claims**

1. A betatron for accelerating charged particles, said betatron having a toroidal vacuum chamber in which particle acceleration takes place, comprising:

means for generating a betatron magnetic field for accelerating charged particles in said vacuum chamber;

means for generating a charged particle beam in said vacuum chamber;

means for generating an electric field to oppose the electric field induced by the diffusion of the self magnetic field of the beam; and



means for energizing said electric field generating means for only the period during which the self magnetic flux diffuses out of said toroidal chamber.

4,481,476

PICTURE DISPLAY DEVICE COMPRISING A PICTURE DISPLAY TUBE AND A CIRCUIT FOR FEEDING THE HEATER THEREOF

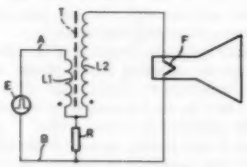
Jan Gerritsen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,399

Claims priority, application Netherlands, Oct. 14, 1980, 8005651

Int. Cl.³ H01F *13/00*

U.S. Cl. 328—270 **5 Claims**



1. A picture display device comprising a picture display tube and a circuit for feeding the heater thereof having a first and a second circuit terminal for connection to an a.c. voltage source, and circuit means whereby the voltage across the heater assumes, at switch-on of the picture display device, a value which is higher than the nominal value and assumes substantially the nominal value after a predetermined warming up period, these means comprising a positive temperature coefficient thermistor, characterized in that one terminal of the heater is connected to one end of a secondary winding of a transformer, one end of a primary winding of which is connected to the first circuit terminal, the other ends of the primary and the secondary windings being interconnected and connected to one terminal of the thermistor, the other terminals of the heater, the thermistor being interconnected and connected to the second circuit terminal and the secondary winding of the transformer having more turns than the primary winding.

4,481,477

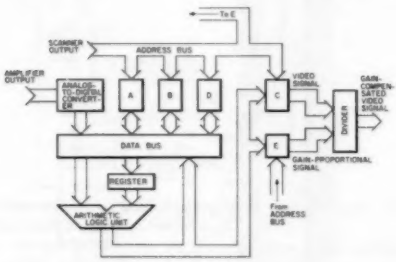
METHOD AND APPARATUS FOR THE REAL-TIME MEASUREMENT OF THE SMALL SIGNAL GAIN OF AN AMPLIFIER

Karl R. Wittig, New York, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 358,541

Int. Cl.³ G01R *19/00*

U.S. Cl. 330—2 **6 Claims**



1. A method of actively measuring the small signal gain of an amplifier, said amplifier, in operation, responding to a small signal input variation about a bias level input, said small signal input varying substantially linearly over a field time interval, said method comprising the steps of:

adding a small bias signal, ΔV, to the bias level input during a portion of the field time interval;

measuring the output of the amplifier at a first time during the field time interval to produce a first measured output, said first time being when the bias signal, ΔV, has not been added to the bias level input;

measuring the output of the amplifier at a second time during the field time interval to produce a second measured output, said second time being when the bias signal, ΔV, has been added to the bias level input;

measuring the output of the amplifier at a third time during the field time interval to produce a third measured output, said third time being different from the first and second times;

multiplying each measured output by a respective preselected fixed number to produce weighted measured outputs; and

adding the weighted measured outputs in such a way that the sum is a signal which is directly proportional to the product of the bias signal, ΔV, with the small signal gain of the amplifier during the field time interval.

4,481,478

DIFFERENTIAL AMPLIFIER HAVING A COMPENSATION CURRENT INJECTION SELECTOR NETWORK

John A. Flink, Santa Clara, and Charles L. Vinn, Milpitas, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 23, 1982, Ser. No. 452,683

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—253 **10 Claims**

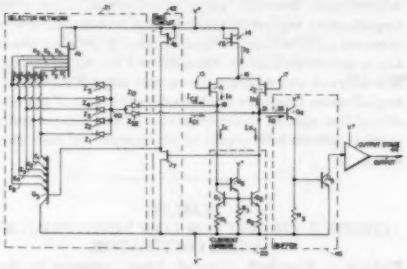
1. A differential amplifier comprising:

(a) means, including a pair of transistors having first electrodes adapted for coupling to a first current source, a pair of input electrodes, and a pair of output electrodes coupled to a pair of output terminals, for feeding a pair of currents to the pair of output terminals from the first current source in a ratio related to the difference in voltages of input signals fed to the pair of input electrodes, such pair of currents having a difference D therebetween when the voltages at the pair of inputs are equal;

(b) a selector network means for adding a compensating

current substantially equal to the difference D to the current fed to one of the pair of output terminals; and

(c) means coupled to the pair of output terminals for equalizing the currents passing from the pair of output terminals



producing an output current substantially zero when the voltages fed to the pair of input electrodes are equal to compensate for the difference D in the pair of currents passing through the pair of input transistors when such voltages are equal.

4,481,479

NEGATIVE-FEEDBACK CIRCUIT FOR AN, ESPECIALLY INTEGRATED, TRANSISTOR AMPLIFIER

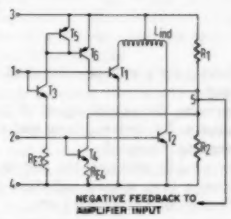
Gerhard Gehring, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,777

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036887

Int. Cl.³ H03F *3/26, 1/34*

U.S. Cl. 330—265 **6 Claims**



1. Negative-feedback circuit for a transistor amplifier having an output stage, an output transformer being operated by the output stage and having a center tap and two ends, the center tap being connected to a supply voltage source, a first output transistor connected to one of the two ends of the transformer and a second output transistor connected to the other end of the transformer, each of said output transistors being driven by a half wave of an information signal and being load carrying during that respective half-wave only, and each of said output transistors having a collector-emitter path and a base, comprising two imaging circuits, one being connected to the base of the first output transistor and the other being connected to the base of the second output transistor so that each of said imaging circuits carries a current which is substantially the equivalent of the current flowing in the collector-emitter path of a respective one of said output transistors connected thereto, and a circuit branch connected to said imaging circuits for combining the current flowing in said imaging circuits into a full-wave voltage signal for negative-feedback.

4,481,480

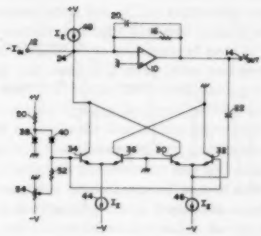
FEEDBACK AMPLIFIER HAVING A VOLTAGE-CONTROLLED COMPENSATION CIRCUIT

Arthur J. Metz, Gervais, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 4, 1982, Ser. No. 432,493

Int. Cl.³ H03F *1/34*

U.S. Cl. 330—294 **7 Claims**



1. A compensation circuit for a feedback amplifier having a feedback resistor connected from the output thereof to an input thereof, comprising:

feedback capacitance means coupled from said output to said input in parallel with said feedback resistor; and

means for varying the effective capacitance of said feedback capacitance means by varying the feedback current from said capacitance means to said input in amounts proportional to said effective capacitance without changing the actual capacitance.

4,481,481

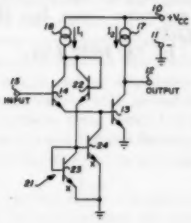
BUFFER INVERTER CIRCUIT WITH ADAPTIVE BIAS

Robert S. Sleeth, Santa Clara, and Dennis M. Monticelli, Fremont, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 11, 1983, Ser. No. 465,721

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—296 **8 Claims**



1. An inverting buffer amplifier circuit having input and output terminals, said circuit comprising

a common emitter output stage driving said output terminal;

an emitter follower input stage driven from said input terminal and driving the base of said output stage, said emitter follower including a means for sourcing current in series with its collector; and

a current mirror having an input coupled to be driven from said collector of said emitter follower and an output coupled to said base of said output stage.

4,481,482

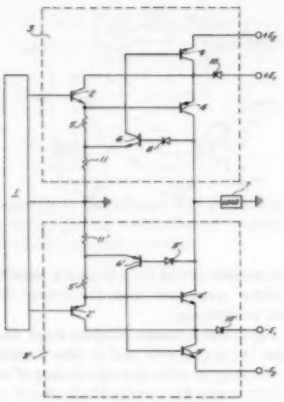
CLASS BC POWER AMPLIFIER

Vassil B. Vassilev; Vassil M. Sofiyanski; Boris V. Vassilev; Panayot Y. Danchev; Angel B. Angelov; Yordan M. Strandjaliev, and Georgi S. Kehayov, all of Sofia, Bulgaria, assignors to Zavod "Elektroakustika", Mihaylovgrad, Bulgaria

Filed Apr. 29, 1981, Ser. No. 258,809

Int. Cl.³ H03F 3/30

U.S. Cl. 330—297 **7 Claims**



1. A class BC power amplifier having a symmetrical push-pull preamplifier and a pair of symmetrical power branches coupled, respectively, to the outputs of said push-pull preamplifier, each of said branches including a first power stage, operating in class B, coupled to the output of said branch, and an intermediate preamplifier coupled to the respective output of said push-pull preamplifier, for controlling said first power stage, characterized in that each of said branches further comprises a second power stage, operating in class C, coupled to said first power stage, and a comparison stage, coupled between said intermediate preamplifier and said branch output for controlling said second power stage.

4,481,483

LOW DISTORTION AMPLIFIER CIRCUIT

Shigeru Kawamura, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1983, Ser. No. 458,094

Claims priority, application Japan, Jan. 21, 1982, 57-8048; Mar. 16, 1982, 57-42137

Int. Cl.³ H03F 3/04

U.S. Cl. 330—297 **4 Claims**

1. A low distortion amplifier circuit, comprising: a transistor amplifier circuit having an input and an output; an input terminal; an output terminal connected to said output of said transistor amplifier circuit; a power source terminal; a first resistor and a plurality of diode elements all connected in series with each other between said output terminal and said power source terminal and oriented to facilitate a current flow from said power source terminal to said output terminal; and a second resistor connected between said input and said input terminal; wherein said transistor amplifier circuit includes at least one amplification transistor; wherein said forward-direction diode elements each include a transistor having the same characteristics as said amplification transistor and having its collector and base shorted; and wherein the current amplification rate of said amplification transistor multiplied by the ratio of the resistance of said first resistor to the resistance of said second resistor is a number substantially equal to the number of said diode elements.

4,481,484

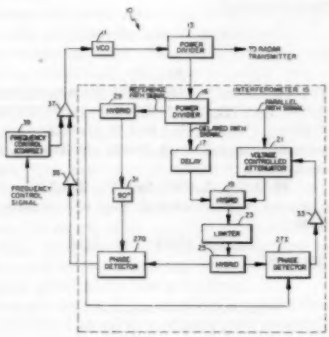
CONTROL CIRCUIT FOR LOW NOISE FREQUENCY AGILE OSCILLATOR

Richard A. Campbell, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 23, 1982, Ser. No. 371,146

Int. Cl.³ H03L 7/00

U.S. Cl. 331—12 **4 Claims**



1. A control ciruit for a voltage-controlled oscillator, such circuit comprising:

(a) means receiving the output signal of the voltage-controlled oscillator, for deriving from said output signal an output representative signal;

(b) means for equally splitting the output representative signal to form a first, second and third signal in corresponding first, second and third paths;

(c) delay means and variable attenuating means disposed, respectively, in the first and the second path;

(d) means for vectorially subtracting the delayed first and the attenuated second signals in the first and the second paths to form a fourth signal having an amplitude and phase, relative to the output signal of the voltage-controlled oscillator, indicative of the instantaneous frequency of said output signal;

(e) means for dividing the third signal into a reference signal and a phase-shifted reference signal in quadrature with the reference signal;

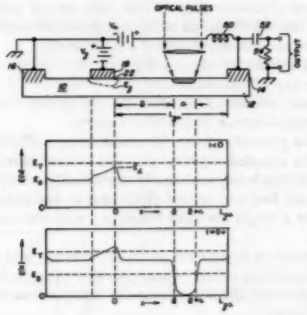
(f) first phase detector means responsive to the phase shifted reference signal and to the fourth signal, and second phase detector means responsive to the reference signal and to the fourth signal, said first phase detector means providing an error signal to control the frequency of the voltage-controlled oscillator and said second phase detector means providing an attenuator control signal to control the fourth signal, thereby ultimately to stabilize the frequency of the output signal of the voltage-controlled oscillator.

4,481,485

OPTICALLY TRIGGERED TRANSFERRED-ELECTRON DEVICE MICROWAVE BURST AND SINGLE PULSE GENERATORS

Thomas F. Carruthers, Laurel; Joseph F. Weller, Fort Washington, both of Md., and Henry F. Taylor, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1982, Ser. No. 345,454
Int. Cl.³ H03B 9/12, 17/00; H01L 31/02
U.S. Cl. 331—66 **14 Claims**



1. A microwave burst generator device comprising:

a substrate of negative differential conductivity semiconductor material, said substrate exhibiting negative differential conductivity characteristics when subjected to an electric field of at least a critical level;

at least two electrode means contacting said substrate and located in a spaced relationship to each other for electrically coupling to said substrate;

potential biasing means coupled to said at least two electrode means for biasing said at least two electrode means with respect to each other, for producing a flow of current in said substrate between said at least two electrodes, and for creating an electric field within said substrate, the maximum value of said field being less than the critical field level of said substrate; and

optical pulse means for supplying at least one optical pulse to said substrate between two of said at least two electrode means, said at least one optical pulse having a duration which is much less than the photocarrier lifetime of said substrate, said at least one optical pulse having a duration on the order of a picosecond, said at least one optical pulse increasing the electric field in at least a portion of said substrate to a level which exceeds said critical field level resulting in the formation and propagation of space-charge domains in said substrate;

wherein the current flowing between said two of said at least two electrode means is periodically interrupted a plurality of times due to said space-charge domain propagation in said substrate thereby producing a burst of microwave oscillations.

4,481,486

ULTRA-HIGH FREQUENCY OSCILLATOR WITH DIELECTRIC RESONATOR OF THE COMPACT HYBRID CIRCUIT TYPE

Alain Bert, and Didier Kaminsky, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 25, 1982, Ser. No. 361,751
Claims priority, application France, Mar. 27, 1981, 81 06185
Int. Cl.³ H03B 5/18
U.S. Cl. 331—99 **7 Claims**

6. An ultra-high frequency oscillator comprising:

a metal support having a base and upstanding walls, said base having a first part and a second part raised above said first part to form a ground plane;

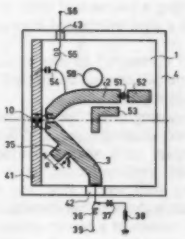
an insulating substrate being supported by said metal support and covering said first part of said base, the upper surface of said substrate being at the level of said second part of said base;

a transistor mounted on said second part of said base and having three terminals, one of said terminals being electrically connected to said second part of said base;

a first transmission line of the microstrip type deposited on said substrate having a first end located near the location of said transistor on said second part of said base and a second end extending away from said second part of said base, said first transmission line having a curved section between said first end and said second end;

a second transmission line of the microstrip type deposited on said substrate having a first end located near said first end of said first transmission line and near the location of said transistor on said second part of said base and a second end extending away from said second part of said base, said second transmission line having a curved section near said second end;

a second terminal of said transistor being electrically connected to said first end of said first transmission line and a third terminal of said transistor being electrically connected to said first end of said second transmission line;



a stud line of the microstrip type connected to said second transmission near the center part thereof and having a direction perpendicular to the direction of said second transmission line, the length of said stud line being less than a quarter wavelength so as to provide a capacitance at the connection between said stud line and said second transmission line and an impedance matching between said third terminal and said second transmission line;

a dielectric resonator being located on one side of said first transmission line and coupled thereto, said resonator being at a distance therefrom so as to obtain the maximum output power;

an angle bracket line of the microstrip type located on the side of said first transmission line opposite said resonator, said angle bracket line formed of two quarter-wave segments connected at their ends at a 90° angle, one of said quarter-wave segments being parallel to said first transmission line;

a resistive load having a first terminal connected to said second end of said first transmission line and a second terminal; and

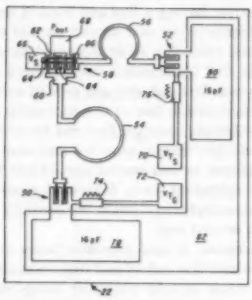
a quarter-wave line of the microstrip type connected to said second terminal of said resistive load and extending in the same direction as said second end of said first transmission line.

4,481,487

MONOLITHIC MICROWAVE WIDE-BAND VCO

Gallon E. Brehm, Plano, and Bentley N. Scott, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 14, 1981, Ser. No. 293,040
Int. Cl.³ H01L *27/04*; H03B *5/00*
U.S. Cl. 331—117 D **23 Claims**



1. A monolithic wideband microwave voltage-controlled oscillator (VCO), comprising:

a semi-insulating substrate;

a doped semiconducting layer above said substrate;

an FET comprising a source and drain in said semiconducting layer, and a gate interposed between said source and said drain;

an input contact connected to one of said source and said drain, and an output contact connected to the other of said source and said drain;

a varactor, comprising a first terminal and second terminal atop said semiconducting layer, said first terminal forming a barrier contact with said semiconducting layer, the portion of said semiconducting layer beneath said first terminal being sufficiently thin and sufficiently lightly doped that punch through between said first terminal and said substrate occurs at a lower voltage then does breakdown between said first terminal and said second terminal; and

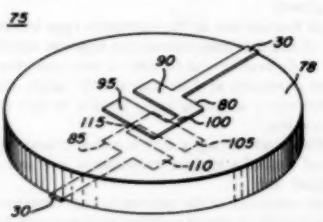
means for providing a bias voltage, connected to a first one of said terminals of said varactor, said gate of said FET being direct current connected to the other one of said terminals of said varactor.

4,481,488

TRAPPED ENERGY RESONATOR FOR OSCILLATOR AND MULTIPLE RESONATOR APPLICATIONS

Lawrence N. Dworsky, Northbrook, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 8, 1982, Ser. No. 439,685
Int. Cl.³ H01L *41/04*; H03B *5/32*
U.S. Cl. 331—158 **9 Claims**



1. A trapped energy piezoelectric resonator operating at a single resonant frequency and overtones thereof for independent use on a substrate having a plurality of resonators, comprising:

a piezoelectric substrate having a first and a second opposed major surface;

a first electrode disposed on said first major surface, said first electrode being comprised of a first plurality of acoustically coupled sub-electrodes;

first means for electrically interconnecting said first plurality of sub-electrodes;

a first conductor attached to said first electrode for electrical circuit connection thereto;

a second electrode disposed on said second major surface, said second electrode being comprised of a second plurality of acoustically coupled sub-electrodes;

second means for electrically interconnecting said second plurality of sub-electrodes;

a second conductor attached to said second electrode for electrical circuit connection thereto;

said first plurality of sub-electrodes being sufficiently acoustically coupled together and said second plurality of sub-electrodes being sufficiently acoustically coupled together for said first and second electrodes to operate as a resonator at a single resonant frequency and overtones thereof; and

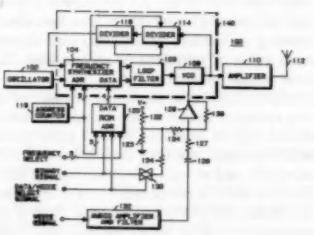
said resonator being sufficiently acoustically and electrically isolated from others of said plurality of resonators on said substrate to allow substantially independent and isolated operation.

4,481,489

BINARY SIGNAL MODULATING CIRCUITRY FOR FREQUENCY MODULATED TRANSMITTERS

Christopher N. Kurby, Elmhurst, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jul. 2, 1981, Ser. No. 280,156
Int. Cl.³ H03C *3/09*; H04L *27/12*
U.S. Cl. 332—19 **10 Claims**



1. Circuitry for frequency modulating an output signal in accordance with a binary signal from a first signal source, the first signal source further providing a data select signal when the binary signal is present, said frequency modulating circuitry comprising:

means for generating a reference signal;

means for comparing the phase of the reference signal to the phase of a feedback signal to provide an error signal;

means for filtering the error signal to provide a filtered error signal;

summing amplifier means having an input and an output;

voltage biasing means coupled to the input of the summing amplifier means for applying a predetermined voltage thereto;

means for coupling an analog signal from a second signal source to the input of the summing amplifier means;

switching means responsive to the data select signal for applying the binary signal to the voltage biasing means;

voltage-controlled oscillator (VCO) means having a first input coupled to the filtered error signal for generating an

output signal and having a second input coupled to the output of the summing amplifier means for frequency modulating the VCO output signal;

means for dividing the VCO output signal by a predetermined number to provide the feedback signal; and

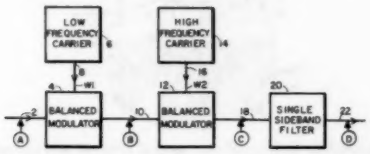
means coupled to the dividing means for varying the predetermined number of the dividing means between a first predetermined number and second predetermined number in response to the binary signal.

4,481,490

MODULATOR UTILIZING HIGH AND LOW FREQUENCY CARRIERS

Christopher R. Huntley, Burnaby, Canada, assignor to AEL Microtel, Ltd., Burnaby, Canada

Filed Jun. 7, 1982, Ser. No. 385,995
Int. Cl.³ H03C 1/54
U.S. Cl. 332—41 **5 Claims**



1. A low carrier-leak voice-frequency signal translation circuit which comprises:

a source of low-frequency carrier signals;

a source of high-frequency carrier signals in which the frequency is very high with respect to that of said low frequency signals;

balanced modulation means responsive to signals from said low-frequency and said high-frequency sources for translating voice-frequency signals to a pre-determined plurality of positions in the frequency spectrum in an output signal thereof with substantially suppressed low frequency carrier; and,

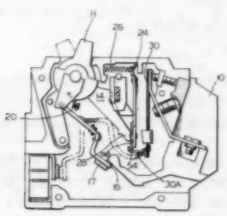
means for selecting a desired one of said frequency spectrum positions in said output signal.

4,481,491

INSULATED LATCH-CRADLE MECHANISM

Eldon B. Heft, West Hartford, and Keith W. Klein, Simsbury, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 6, 1983, Ser. No. 456,136
Int. Cl.³ H01H 73/02
U.S. Cl. 335—21 **1 Claim**



1. An electric circuit breaker having improved common trip capability comprising:

contact means operatively mounted within an insulated circuit breaker casing for providing electrical connection between a pair of circuit breaker terminals;

handle means for operatively moving said contacts between a closed and open configuration;

tripping means for rapidly moving said contacts from said closed position to said open position upon the occurrence of an overload;

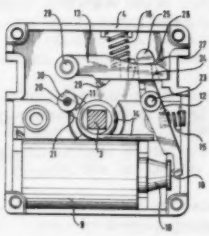
said tripping means comprising metallic cradle having and end in releasable contact with a latch under defined operating conditions and a metallic armature in magnetic relation with one of said breaker terminals for separating said latch and cradle upon occurrence of said overload, said latch preventing said cradle from opening said contacts under a defined range of operating conditions and for allowing said cradle to open said contacts upon the occurence of said overload, said latch comprising an insulating plate secured to a bottom of an opening through said armature for preventing electrical conduction between said cradle and said armature during said overload.

4,481,492

ROTARY ELECTRIC SWITCH WITH AN AUTOMATIC MECHANISM WHICH RESETS IT WHEN NO VOLTAGE IS APPLIED THERETO

André Borne, Villeurbanne; André Marmonier, Bron, and Etienne Briguet, Rillieux-la-Pape, all of France, assignors to Cgee Alsthom, Levallois-Perret, France

Filed Nov. 24, 1982, Ser. No. 444,117
Claims priority, application France, Nov. 26, 1981, 81 22132
Int. Cl.³ H01H 9/20
U.S. Cl. 335—164 **5 Claims**



1. A rotary electric switch with an automatic mechanism for resetting the switch to a rest position when insufficient voltage is applied thereto, said switch including, for said purpose, a rotatable control shaft fitted with a return spring for rotatably returning it to the rest position, an electromagnet with a moving core which, when released on a drop in voltage, triggers the return, and a configuration of three levers fixed together in pairs when said switch is cocked, said three levers comprising; a first lever integral with the control shaft, a second lever pivoting on a stationary middle shaft under the control of the respective actions of the core when released and of an antagonistic spring, a third lever pivoting on a stationary end shaft and fitted with a return spring to firstly hold the control shaft and the first lever in the operating position by fixing it to the other levers and secondly to release the first lever and cause the return of the switch to the rest position when said third lever is released by the second lever which is itself actuated by the core being released, the improvement wherein, in said switch, the shafts of the first and second levers are disposed on the same side of the third lever, said third lever having at its middle a lock projection for the first lever and a free end having a notched transversal passage in which the furthest end of the second lever from the core can move, said furthest end having a hooked portion located on the other side and opposite end to said second lever relative to the core so as to fix the end of the second lever in the notch of the notched passage when the core is retracted due to the effect of an electric voltage being applied to the electromagnet and the control shaft is placed in the cocked position.

4,481,493
POLARIZED ELECTROMAGNETIC RELAY

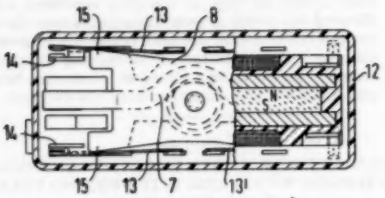
Ulrich Kobler, Munich, and Eberhard Wanka, Dachau, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,233

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140226

Int. Cl.³ H01H *51/24*

U.S. Cl. 335—179 **15 Claims**



1. A polarized electromagnetic relay comprising:

two parallel spaced U-shaped yokes each having two upwardly depending yoke legs respectively disposed at opposite ends of said yokes, and each yoke having a center section between said yoke legs;

at least one permanent magnet disposed between said center sections of said yokes, said permanent magnet and said center sections of said yokes being together encased with insulating material forming a coil body;

a coil wound about said coil body, said center sections of said yokes and said permanent magnet forming the core for said coil;

a U-shaped armature consisting of an elongated ferromagnetic plate having opposite downwardly depending armature legs respectively disposed between said yoke legs and forming a plurality of working air gaps in combination therewith, said legs of said armature extending beyond said coil;

a base body covering said coil in the form of an inverted cup, said cup having a stepped top surface for permitting unobstructed movement of said downwardly depending armature legs, said armature being pivotally mounted on said base body at the center of gravity of said armature, said base body having a plurality of passages disposed in the area of said yoke legs; and

a plurality of contact terminal elements extending through said passages and secured laterally relative to said coil.

4,481,494
BI-METAL SNAP DISC OPERATED RELAY

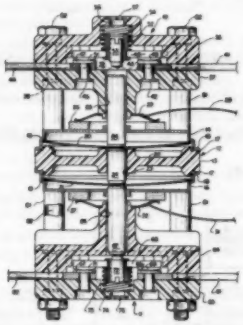
Richard M. Anderson, Shelby; Harold F. Snider, and Donald J. Schmitt, both of Mansfield, all of Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Jan. 31, 1983, Ser. No. 462,670

Int. Cl.³ H01H *37/52*

U.S. Cl. 337—95 **18 Claims**

1. A thermal relay comprising a body, first and second snap acting elements each operable in a free state to move with snap action from a first position of stability to a second position of stability upon reaching a second predetermined temperature and to move back to said first position of stability upon reaching a first predetermined temperature, said first and second predetermined temperatures of said first snap element being substantially equal to said first and second predetermined temperatures of said second snap element, said predetermined temperatures being substantially above the environmental temperature in which said relay is intended to operate, said elements being mounted on said body so that they tend to move toward each other upon moving to said first position of stability, an elongated bumper positioned in said body between said elements and engaging at its ends said elements to maintain them in the same position with respect to each other and cause them to simultaneously snap between their two positions of stability, said snap elements exerting a compressive force on said bumper in all conditions of normal operation of said relay, said bumper being free of constraints resisting movement of said snap elements in the directions away from each other, a first heater being operable to heat said first element without



corresponding heating of said second element and operable to cause said elements to snap in one direction in unison, a second heater operable to heat said second element without corresponding heating of said first element and operating to cause said elements to move in a direction opposite to said one direction in unison, and switch means operated in response to snap movement of said elements.

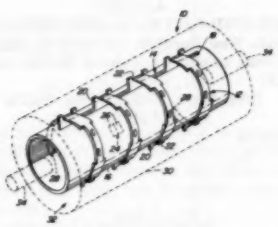
4,481,495
FUSIBLE ELEMENT FOR A CURRENT-LIMITING FUSE HAVING GROUPS OF SPACED HOLES OR NOTCHES THEREIN

John M. Jarosz, Skokie, and William R. Panas, Glenview, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Oct. 29, 1982, Ser. No. 437,776

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—159 **18 Claims**



1. A fusible element for a high-voltage, current-limiting fuse, comprising:

an elongated, thin, conductive ribbon of substantially uniform thickness, the ribbon including first and second regions of two different widths measured transversely of the ribbon, the regions alternating along the ribbon, the width of the first regions being greater than the width of the longitudinally adjacent second regions, there being at least two second regions, and

a plurality of groups of holes or notches formed through or in the ribbon, each group being within a respective second region and extending along the ribbon, adjacent holes or notches of each group being separated therewithin by a

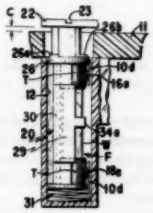
first distance, measured along the ribbon, which is substantially less than a second distance between adjacent groups, measured along the ribbon, so that both higher and lower voltage fault currents are effectively interrupted, and so that the arc voltage developed by the fuse during the occurrence of the lower voltage fault currents does not exceed a predetermined value.

4,481,496

SWITCHING FUSIBLE APPARATUS

Alexander R. Norden, 350 Central Park West, New York, N.Y. 10025

Filed Sep. 27, 1982, Ser. No. 423,839
Int. Cl.³ H01H *85/50*
U.S. Cl. 337—213 **10 Claims**



1. Switching fusible apparatus comprising a fuse holder and a receptacle therefor, said receptacle having a cavity with an opening and a pair of contacts at different distances from the opening, said fuse holder when in its switching location in the receptacle being rotatable about an axis to assume "release", "off" and "on" positions and, when in said "release" position, being movable along said axis for removal from and insertion into the cavity, said fuse holder being formed to contain a fuse having spaced-apart end caps positioned for engagement with the receptacle contacts, respectively, when the fuse holder is in its "on" position, at least one of said receptacle contacts being spaced from a respective one of the fuse end caps when the fuse holder is in its "off" position, said receptacle and said fuse holder having respective detenting obstructions that are mutually cooperable when the fuse holder is in either said "on" position or said "off" position for both blocking axially outward movement of the fuse holder and retaining the fuse holder against rotation out of either selected "on" or "off" position, the fuse holder being movable axially inward to release the mutual cooperation of the detenting obstructions, the extent of said obstructions being limited so that the fuse holder is free for axial insertion into and removal from the receptacle in said "release" position, said apparatus having spring means biasing the fuse holder axially outward for effecting said cooperation of the detenting obstructions in each of the "on" and "off" positions of the fuse holder.

4,481,497

TRANSDUCER STRUCTURES EMPLOYING CERAMIC SUBSTRATES AND DIAPHRAGMS

Anthony D. Kurtz, Englewood; Joseph R. Mallon, Jr., Franklin Lakes, and Timothy A. Nunn, Ridgewood, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Oct. 27, 1982, Ser. No. 437,109
Int. Cl.³ G01L *9/06, 1/22*
U.S. Cl. 338—2 **13 Claims**

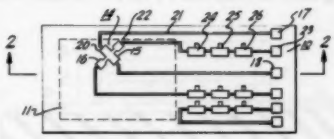
1. A hybrid pressure transducer, comprising:

a planar member fabricated from a ceramic material and having a section thereof defining an active area,.

a semiconductor strain gage secured on a surface of said planar ceramic member within said active area, said gage positioned closer to one edge of said planar member within said area and being of a "cross-like" construction manifesting a shear gage,

terminal means printed on said surface containing said strain gage, said terminal means printed on said surface by a thick film technique employing a conductive organic ink,

conductor means printed on said surface by a thick film



technique for interconnecting said strain gage with said terminal means,

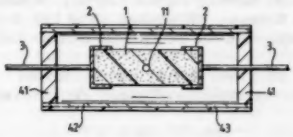
resistor means printed on said surface by a thick film technique for providing means for compensating said strain gage wherein said semiconductor strain gage is separately fabricated and subsequently attached to said planar member by an insulating bonding layer.

4,481,498

PTC CIRCUIT PROTECTION DEVICE

Mary S. McTavish, Fremont; Robert W. Stodieck, Palo Alto, and Frank A. Doljack, Pleasanton, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 17, 1982, Ser. No. 349,505
Int. Cl.³ H01C *1/00, 7/02*
U.S. Cl. 338—20 **35 Claims**



1. A circuit protection device which comprises

(1) a PTC element composed of a conductive polymer composition which exhibits PTC behavior and which comprises a polymeric component and, dispersed in the polymeric component, a particulate conductive filler comprising carbon black;

(2) two electrodes which are electrically connected to the PTC element and which are connectable to a source of electrical power to cause current to pass through the PTC element; and

(3) an enclosure

(a) which encloses and is spaced apart from at least the potential erosion zone of the PTC element;

(b) which is substantially impervious to carbon dust; and

(c) at least a part of whose interior surface is composed of an insulating material which passes the carbon burn-off test at a test voltage of 440 volts DC,

whereby the adverse effects of carbonaceous dust evolved by the PTC element when it is tripped are minimized.

4,481,499

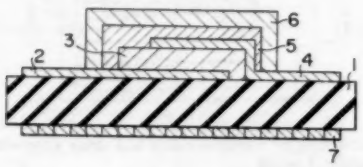
GAS DETECTOR

Hideo Arima; Masayoshi Kaneyasu, both of Yokohama, and Mitsuko Ito, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 27, 1983, Ser. No. 489,179
Claims priority, application Japan, May 7, 1982, 57-75096
Int. Cl.³ G01N *27/04;* H01L *7/00*
U.S. Cl. 338—34 **13 Claims**

1. A gas detector which comprises a layer of gas sensing

material comprising a p-type oxide semiconductor or an n-type oxide semiconductor, and at least one pair of coating layers comprising a layer containing a p-type oxide semiconductor and a layer containing an n-type oxide semiconductor provided in a multilayer arrangement on the surface of said layer of gas sensing material that contacts the gas, wherein when the gas sensing material comprises a p-type oxide semiconductor,



the at least one pair of coating layers is formed in the order of a coating layer containing an n-type oxide semiconductor followed by a coating layer containing a p-type oxide semiconductor and when the gas sensing material comprises an n-type oxide semiconductor, the at least one pair of coating layers is formed in the order of a coating layer containing a p-type oxide semiconductor following by a coating layer containing an n-type oxide semiconductor.

4,481,500

ELECTRODE FOR ELECTRIC ARC FURNACES

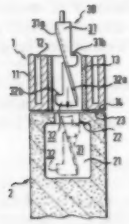
Dieter Zöllner, Schwaig; Claudio Conradty, Röthenbach, and Friedrich Rittmann, Rückersdorf, all of Fed. Rep. of Germany, assignors to Arc Technologies Systems Ltd., Cayman Islands

Filed Nov. 30, 1981, Ser. No. 326,068

Claims priority, application European Pat. Off., Dec. 2, 1980, 80107523.5

Int. Cl.³ H05B 7/08

U.S. Cl. 373—93 **45 Claims**



1. In an electrode for arc furnaces, especially for the production of electrosteel, including an electrical current conducting metallic, liquid-cooled upper electrode shaft portion and a consumable lower active portion; the improvement comprising: a securing means detachably connecting the upper electrode shaft portion and the consumable active portion whereby an electrical contact surface of the active portion is pressed against and forcibly retained against an electrical contact surface of the upper electrode shaft portion, the securing means being a clamping means effecting both an essentially compressive pressure-load upon the material of the active portion and a drawing force upon the active electrode portion whereby the electrical contact surface of the active portion is drawn forcibly against the contact surface of the upper electrode shaft portion.

4,481,501

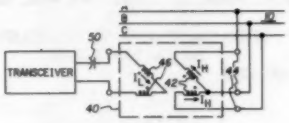
TRANSFORMER ARRANGEMENT FOR COUPLING A COMMUNICATION SIGNAL TO A THREE-PHASE POWER LINE

William C. Perkins, Sachse, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 934,449, Aug. 17, 1978, Pat. No. 4,188,619. This application Jan. 26, 1981, Ser. No. 228,651

Int. Cl.³ H04B 3/54

U.S. Cl. 340—310 R **3 Claims**



1. A transformer arrangement for simultaneously coupling a signal to all three phase conductors of a three-phase power line, comprising:

a pair of high voltage windings serially connected, with their commonly connected leads being connected to one phase of the power line and the uncommon lead of each winding being connected to a different one of the other two phases of the power line;

a pair of low voltage windings serially connected across which the signal is applied, and

means for magnetically coupling each winding of one pair with a different winding of the other pair so that the current flowing through and between said high voltage windings is the same.

4,481,502

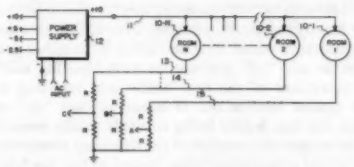
CENTRAL SMOKE ALARM AND ANNUNCIATOR

N. Rick Dawson, 220 Fentress Blvd., Daytona Beach, Fla. 32014

Filed Mar. 26, 1982, Ser. No. 362,554

Int. Cl.³ G08B 29/00

U.S. Cl. 340—516 **14 Claims**



1. In a system having a plurality of remote electronic smoke detectors, each detector having a low electrical current idle condition, a steady high electrical current alarm condition, and a periodic high electrical current test condition, the centralized smoke and fault alarm system comprising:

a plurality of current sensing means at a central location for monitoring separately the current to each of said smoke detectors, each of said current sensing means producing a first output signal responsive to said steady high current alarm condition and a second output signal responsive to the absence of said periodic high current test condition of its associated smoke detector;

a plurality of alarm indicators wherein each of said current sensing means is connected to one of said indicators, each of said indicators for identifying the location of its associated smoke detector, for producing a smoke alarm indication responsive to said first output signal and for producing a fault indication responsive to said second output signal; and

a common alarm connected to said plurality of current sensing means for producing a common audible and visual

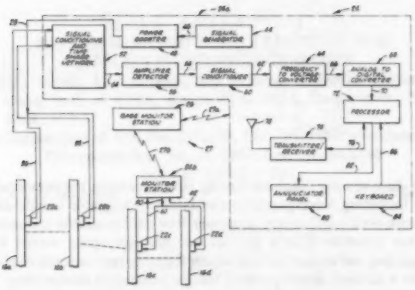
alarm signal in response to a smoke alarm or a fault alarm from any of said plurality of remote smoke detectors.

4,481,503

PRODUCTION MONITORING SYSTEM

F. Allen Lehman, Oklahoma City; William M. Sieffel, Moore, and Malcolm G. Ray, Norman, all of Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jul. 29, 1982, Ser. No. 403,281
Int. Cl.³ G01B *26/00*
U.S. Cl. 340—518 **35 Claims**



1. A monitoring system for monitoring fluid flow passing through a monitored flowline, comprising:

a transducer connected to the monitored flowline and adapted to detect the flow of fluids passing through the monitored flowline, the transducer being adapted to provide a flow signal proportional to the velocity of fluid flowing through the monitored flowline; and

means for receiving the flow signals provided by the transducer, said means including a portion having a predetermined alarm value and a predetermined alarm delay time stored therein wherein the alarm value and the alarm delay time is predetermined for the monitored flowline,

said alarm value being a velocity having a value between about fifty percent (b 50%) and about twenty percent (20%) of a predetermined maximum value of the velocity of the fluid flowing through the monitored flowline where the values of the velocity of the fluid flowing through the monitored flowline substantially vary over a predetermined period of time and

said alarm value being a velocity having a value slightly less than a predetermined minimum value of the velocity of the fluid flowing through the monitored flowline where the values of the velocity of the fluid flowing through the monitored flowline are relatively constant over a predetermined period of time, and

said alarm delay time being a period of time sufficient to encompass at least about three predetermined maximum velocity peaks of the fluid flowing through the monitored flowline and in excess of a predetermined minimum period of time, and

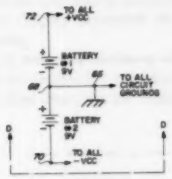
said means providing an output indication in response to receiving a flow signal from the transducer indicating the velocity of the fluid flowing through the monitored flowline to have a value below the predetermined alarm value for a period of time in excess of the predetermined alarm delay time, thereby indicating a problem production condition in the fluid flow passing through the monitored flowline.

4,481,504

SOUND LEVEL ALARM WHICH IGNORES TRANSIENT SOUNDS

Wallace A. Scott, II, 3633 Redbud, Odessa, Tex.

Filed Nov. 16, 1981, Ser. No. 321,600
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—573 **10 Claims**



1. Method of detecting and acknowledging the existence of noise of selected duration and magnitude, comprising the steps of:

(1) generating a signal which is proportional to the magnitude of the noise;

(2) connecting the generated signal to enable a first electronic switch to conduct current to an acknowledging device when said generated signal is in excess of a selected magnitude;

(3) connecting a first timing device to enable a second electronic switch to conduct current to said first electronic switch;

(B 4) connecting a second timing device to enable current to flow to said second electronic switch;

(5) flowing pulses of current from said second timing device to said second electronic switch;

(6) simultaneously actuating said first and second timing devices to enable said second electronic switch to conduct current to said first electronic switch;

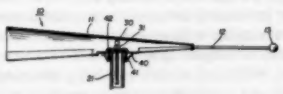
(7) setting the length of the pulse of the first timing device to a value which is less than the length of the pulse from the second timing device so that the acknowledging apparatus is energized only when a noise generates a signal during the time interval that the first timing device is energized.

4,481,505

ILLUMINATED MAST-TOP WIND INDICATOR

David M. Thompson, 803 Mantoloking Rd., Brick Town, N.J. 08723

Filed Jan. 21, 1982, Ser. No. 341,278
Int. Cl.³ G08W *1/00, 1/02*
U.S. Cl. 340—601 **4 Claims**



1. A mast-top wind indicator comprising a hollow conical section having an upper parabolic cross section; a hollow tubular shaft extending through the lower portion, near the middle of said hollow conical section, perpendicular to the axis of said conical section; pivotable means supporting said conical section on said tubular shaft; a balancing rod attached to, and extending axially away from, the narrow end of said hollow conical section; at least one light bulb mounted on the top of said hollow tubular shaft within said hollow conical section at the focal point of said parabolic cross section; a source of electricity; means, extending through said hollow tubular shaft, for connecting said source of electricity to said light bulb; light transmitting panels forming a substantial portion of

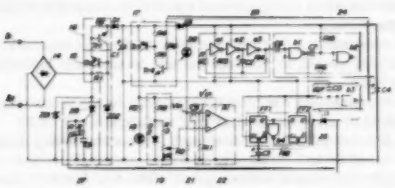
said lower portion of said hollow conical section; and reflecting material coating the inside of said upper, parabolic cross section to concentrate the light from said light bulb through said light-transmitting panels, downward along the axis of said tubular shaft to be visible from the deck below.

4,481,506

PHOTOELECTRIC SMOKE SENSOR

Hiroshi Honma, Hino, Japan, assignor to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1982, Ser. No. 357,712
Claims priority, application Japan, Mar. 18, 1981, 56-38903
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—630 **5 Claims**



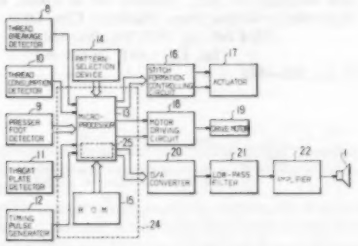
1. A photoelectric smoke sensor, comprising a light emitting diode driven intermittently to emit light and irradiating smoke entering a smoke sensing chamber with pulsed light; a photo diode receiving light scattered by smoke entering the smoke sensing chamber and converting the received light into an electrical signal; a differentiating circuit, and a comparator supplied with power intermittently and in synchronism with the driving of said light emitting diode and receiving and output signal from said photo diode at one input terminal thereof via said differentiating circuit, said comparator receiving a predetermined reference voltage at another input terminal thereof in synchronism with the driving of said light emitting diode and generating an output when an output voltage of the differentiating circuit exceeds said predetermined reference voltage; a latch circuit storing the output from said comparator and generating an output when said comparator, after having been supplied with power on two successive occasions, has generated an output on at least said two successive occasions; and a switching circuit receiving the output from sid latch circuit and actuated thereby to conduct to short-circuit power and signal lines leading to a central signal station whereby a fire signal is transmitted to the central signal station, a resistor, said photo diode having a junction capacitance not exceeding 100 pF and being connected in series with said resistor; a voltage appearing at said resistor forming the output signal from said photo diode and being fed to said comparator via said differentiating circuit; a pulse generating circuit emitting rectangular pulses having a width and a predetermined pulse repetition period to intermittently drive said light emitting diode, a reference voltage setting circuit and said comparator circuit in synchronism with each other; said latch circuit comprising two-stage flip-flop having clock terminals arranged to receive clock signals synchronized with decay of said rectangular pulses; an output of the photo diode being detectable at point of decay of the drive pulse.

4,481,507

ABNORMAL CONDITION WARNING APPARATUS FOR A SEWING MACHINE

Michitaka Takiguchi, and Takao Sugaya, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 18, 1981, Ser. No. 264,613
Claims priority, application Japan, May 30, 1980, 55-66731
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—679 **2 Claims**



1. In a sewing machine having stitch forming instrumentalities including a reciprocable and laterally joggable needle and a work-feed mechanism, a presser foot exchangeably mounted to the lower end of a presser bar and actuating means for imparting movement to said stitch forming instrumentalities to form a desired stitch pattern; the improvement comprising:

a bar code attached to said presser foot;

detecting means disposed in said machine for optically detecting said bar code and generating a detection signal representing said bar code;

pattern selecting means for providing a pattern code signal corresponding to a desired stitch pattern of a plurality of predetermined stitch patterns;

memory means for storing speech data related to the unsuitability of said presser foot;

means for determining responsive to said detection signal and said pattern code signal whether or not said presser foot is suitable to form said desired stitch pattern and for extracting speech data from said memory means when said presser foot is unsuitable to form said desired stitch pattern; and

electroacoustic means disposed in said machine for providing a voice sound responsive to said extracted speech data.

4,481,508

INPUT DEVICE WITH A REDUCED NUMBER OF KEYS

Fumio Kamei, Nara, and Shigenobu Yanagiuchi, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 24, 1981, Ser. No. 334,079
Claims priority, application Japan, Dec. 26, 1980, 55-188082
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—712 **5 Claims**

1. A compact data input and display device for an electronic apparatus, said device comprising:

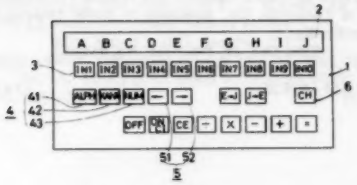
a character display field having a predetermined number of character display positions;

character selection means for selecting an alphanumeric character type and for displaying a plurality of characters of the selected type in said representative positions of said display field;

a plurality of input keys equal in number to said predetermined number and corresponding respectively to said positions of said display field;

means responsive to actuation of any of said input keys for inputting to the electronic apparatus the character displayed in the position of said display field corresponding to the actuated input key; and

display mode selecting means for causing said display field to selectively display exlusively either said selective type



of characters or data previously input to said electronic apparatus.

4,481,509

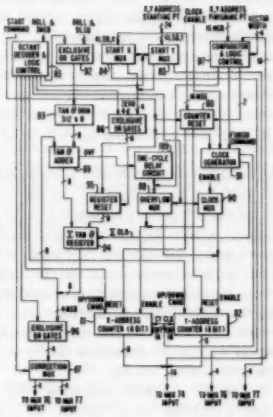
RASTER-SCANNED DISPLAY SYSTEM FOR DIGITALLY-ENCODED GRAPHICS

Akira Sasaki, Los Angeles, and William J. Davis, Thousand Oaks, both of Calif., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 217,842, Dec. 18, 1980, abandoned. This application Jul. 11, 1983, Ser. No. 512,569

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—728 **19 Claims**



1. In a display system for displaying on a raster-scanned screen of the display system, graphic information extracted from a digitally encoded description, the combination comprising:

a memory for storing graphic information in digital word format at addressable storage locations mapping specified pixel locations in the display, the digital word stored in each storage location associated with a pixel location having a plurality p in number of bits encoding the departure the associated pixel is to have in a prescribed direction on the display screen from the pixel location specified by the storage location address in order to provide additional resolution in the definition of the position of a line or the boundary of an area which is to be displayed, the encoding of the departure being such that the plurality p of bits describe a number greater than p of different departures said pixel can have from its normal position in said prescribed direction, thereby to increase the positional resolution of the graphic information stored in said memory for said prescribed direction, with the attendant increase in memory size by the product of the number of addressable locations in memory times the p bits encoding pixel departures from specified address locations being a substantially smaller increase in memory size than increasing the number of addressable locations available in memory to obtain the additional resolution;

means for reading digital words from said memory in accordance with a scanning pattern related to the raster scanning of the screen of the display system; and

means responsive to said digital words for generating signals to control the display presented on said raster scanned screen, including

means responsive to said plurality p of bits in each of said digital words for enhancing the resolution of said display in said prescribed direction by substantially more than p times.

4,481,510

ELECTROOPTICAL SWITCHING DEVICE

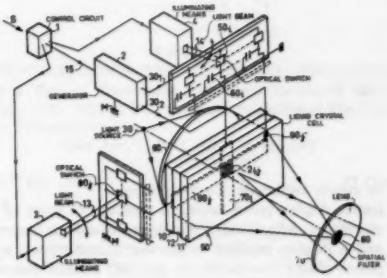
Michel Hareng; Robert Hehlen; Serge LeBerre, and Pierre Leclerc, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 22, 1981, Ser. No. 333,408

Claims priority, application France, Dec. 23, 1980, 80 27315

Int. Cl.³ G09G *3/36*

U.S. Cl. 340—784 **9 Claims**



1. A visual display comprising:

plural display elements formed by plural electrodes arranged in first and second orthagonal arrays to define a visual display zone;

data generation means for generating first signals to be applied to the electrodes of the first array electrodes and for supplying second signals in the form of predetermined potentials to be applied to the electrodes of said second array, said first signals having a voltage level which varies in correspondence to an image to be displayed;

switching means for connecting said first signals and said second signals to the electrodes of said first and said second arrays, respectively, comprising,

optically controlled switching elements each having a first terminal coupled to said data generation means and a second terminal coupled to a respective electrode, said first signals coupled to the first terminal of the switching elements connected to the first array of said electrodes and said second signals applied to respective of the first terminals of the switching elements and through respective resistors to the electrodes of the second array,

optical addressing means for optically scanning said switching elements to control switching of said switching elements, and

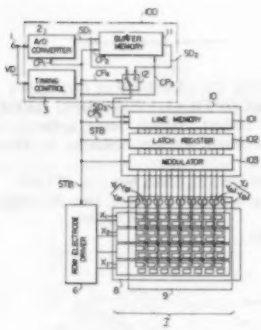
memory capacitors connected to respective second terminals of said switching elements which have said first signals applied to the first terminals thereof.

4,481,511

MATRIX DISPLAY DEVICE

Hisao Hanmura, Hitachi, and Masahiro Takasaka, Hitachiota, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,690
Claims priority, application Japan, Jan. 7, 1981, 56-347; Jan. 7, 1981, 56-378
Int. Cl.³ G09G 3/20
U.S. Cl. 340—752 12 Claims



1. A matrix display device comprising:

a matrix display panel having a plurality of rows of row electrodes and a plurality of columns of column electrodes and a display medium interposed therebetween, cross-points of said row electrodes and said column electrodes defining picture cells arranged in a matrix form, each of said column electrodes forming part of a respective single column of matrix picture cells and being divided into a plurality of groups of cell electrodes with a predetermined regularity, each group of cell electrodes being electrically interconnected within each column, and terminals of at least two groups of cell electrodes in each of said plurality of column electrodes being arranged to extend to the same side of said matrix display panel;

a row electrode drive circuit for producing row electrode drive signals to be applied to said row electrodes in accordance with received video data;

a column electrode drive circuit for producing column electrode drive signals to be applied to said two groups of cell electrodes in each column in accordance with said video data, outputs of said column electrode drive circuit being arranged in the same order as the arrangement of said terminals of said two groups of cell electrodes in each column; and

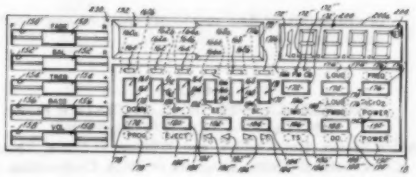
a video data circuit for supplying said video data to said row electrode drive circuit and said column electrode drive circuit, including at least one memory for temporarily storing at least one row of picture cells of video data and switch means for producing a plurality of rows of picture cells of video data in one scan line period based on said one row of picture cells of video data stored in said memory and one adjacent row of picture cells of video data not stored in said memory.

4,481,512

THEFT-RESISTANT AUDIO SYSTEM FOR VEHICLE

Fred L. Tscheulin, Scottsburg, Ind.; Donald R. Tilley, Jeffersontown, Ky.; Steven K. Schubert, and William G. Skyllingstad, both of Louisville, Ky., assignors to Audio Systems, Inc., Louisville, Ky.

Filed Dec. 29, 1982, Ser. No. 454,467
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—825.25 13 Claims



1. An audio system for use in a vehicle, comprising:

a digitally controllable audio signal source for providing audio signals from the output thereof,

visual display means responsive to d.c. display-controlling signals for controlling said display means to display the status of said audio system,

manually-operable switch means for generating d.c. input signals in response to manual activation of said switch means,

a microprocessor-based controller having an input responsive to said d.c. input signals from said switch means and an output electrically connected to the input of said audio signal source for providing digital control signals to control said audio signal source, said controller being operative to generate said d.c. display-controlling signals, as an incident to generation of said digital control signals, for controlling said display,

speaker means electrically connected to the output of said audio signal source to transduce audio signals output therefrom into audible sound,

mounting means for securely mounting said audio signal source and controller in a vehicle to resist removal thereof, and

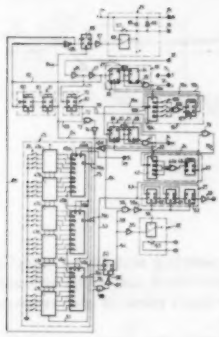
quick-connect/disconnect means for readily releasably electrically connecting and disconnecting said switch means and visual display means to said controller while said audio signal source and controller remain securely mounted to said vehicle for facilitating, on an alternative basis, either (a) disablement of said audio system by disconnection and removal of said switch means and visual display means or (b) selective manual control of said audio signal source in response to manual activation of said switch means and display of the status of said audio system in response to d.c. display-controlling inputs thereto from said controller when said switch means and visual display means are connected, said quick-connect/disconnect means being disconnected from the output of said audio signal source to electrically isolate said audio signal source output from said manual switch means and display means when said switch means and display means are connected to said controller, thereby minimizing introduction of audio frequency interference into said audio signal source from said switch means and display means.

4,481,513

ELECTRONIC INDENTIFICATION SYSTEM

Alain M. Mole, 138 Avenue Ambroise Croizat, 38400 Saint Martin d'Heres, and Jean-Louis P. J. Savoyet, La Mayrie, 38770 La Motte d'Aveillans, both of France

Filed May 12, 1982, Ser. No. 377,311
Claims priority, application France, May 12, 1981, 81 09453
Int. Cl.³ H04Q 9/00; G08B 9/00; E05B 49/00
U.S. Cl. 340—825.31 18 Claims



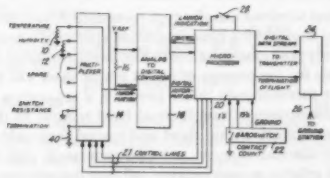
1. An electronic identification system. comprising a moveable part containing a readable memory and a preprogrammed passive memory area containing an electronic identification code, connected to said readable memory and a fixed part capable of being coupled with the moveable part and comprising electric power supply means, loading electronic means for supplying at least one pulse causing the electronic identification code to be loaded into the readable memory of the said moveable part, reading electronic means for reading the contents of the readable memory of the moveable part and transferring said contents into a second memory in the fixed part and comparison means for comparing said contents with a code preprogrammed into the said fixed part, characterized in that said reading electronic means supplies a set number of loading pulses to said moveable part, with the readable memory of the moveable part being subdivided into a certain number of elements connected together but loaded independently, and further comprising loading control means in the moveable part for producing the successive loading of each memory element following each of a set number of pulses and permutation means in the movable part for modifying the contents of the readable memory in response to a sequence of pulses of a number exceeding the number of memory elements.

4,481,514

MICROPROCESSOR BASED RADIOSONDE

John M. Beukers, and Christian B. Williams, both of Stony Brook, N.Y., assignors to Beukers Laboratories, Inc., St. James, N.Y.

Filed Mar. 9, 1982, Ser. No. 356,428
Int. Cl.³ C08C 19/16, 17/00
U.S. Cl. 340—870.1 9 Claims



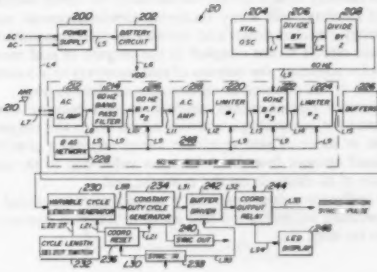
1. A radiosonde comprising a plurality of means for sensing selected ambient meteorological conditions, means operatively coupled to said sensing means for producing a corresponding plurality of electrical analog signals representative of the sensed meteorological parameters, means operatively connected to said analog signal producing means for converting said analog signals into corresponding binary signals, switching means operatively interposed between said sensing means and said converting means for sequentially operatively connecting each of said sensing means to said converting means, reference means operatively connected to the output of said switching means and the input of said converting means, said switching means being effective to sequentially connect said sensing means to said reference means, thereby to develop an analog signal at said reference means that reflects the parameter sensed by the one of said sensing means then being operatively connected by said switching means to the input of said converting means, a microprocessor operatively connected to said converting means for processing said binary signals, and transmitter means operatively connected to said microprocessor for transmitting a signal modulated by said binary signals to a remote ground station.

4,481,515

COORDINATOR FOR TRAFFIC SIGNAL CONTROLLER

James A. Benson, Huntingdon Valley, and Amadio D. Buccini, Maple Glen, both of Pa., assignors to Philmont Electronics, Inc., Philadelphia, Pa.

Filed Apr. 1, 1982, Ser. No. 364,296
Int. Cl.³ G08G 1/07
U.S. Cl. 340—912 22 Claims



1. A coordinator for a traffic signal controller including motor means and associated switching means for establishing the duty cycle of said controller, said controller being powered by AC mains connected to an electric power grid, said coordinator comprising detecting means and coordinating means responsive thereto for providing a synchronizing signal to said motor means and associated switching means during each duty cycle and in synchronization with the frequency of the alternating current provided to said controller by said AC mains, said detecting means comprising means for receiving AC signals from said mains and for receiving stray radiation having a frequency component of the frequency of said AC signal appearing on said power grid and for providing timing signals to said coordinating means, said coordinating means operating in response to said timing signals for producing said synchronizing signals based on said timing signals.

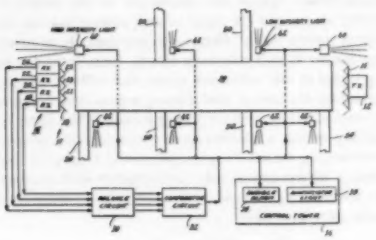
4,481,516
LOW VISIBILITY RUNWAY MONITOR

Paul E. Michelotti, 59 Bob Hill Rd., Ridgefield, Conn. 06877

Continuation-in-part of Ser. No. 201,009, Oct. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 949,436, Dec. 14, 1978, abandoned. This application Sep. 29, 1982, Ser. No. 428,196

Int. Cl.³ G08G *1/01*; G08B *13/18*

U.S. Cl. 340—933 **3 Claims**



1. A runway collision avoidance system for use in conjunction with a runway of the type having an elongated landing surface including an approach end, and at least one intersecting taxiway, and defining an aircraft approach path extending from the approach end along the axis of the runway, for providing a warning to aircraft when an obstruction is on the runway, comprising:

an electromagnetic wave transmitter having an antenna array positioned beyond one end of the runway, said antenna array being positioned to horizontally cover substantially the full width of the runway, said transmitter and antenna array directing electromagnetic wave energy substantially across the entire width and longitudinally along the entire length of the runway;

a plurality of electromagnetic wave receivers each having an antenna arranged in a horizontal array at the other end of the runway which covers substantially the entire width of the runway, said array receiving electromagnetic wave energy directed down said runway by said transmitter;

balance circuit means coupled to the outputs of said receivers for adjusting the outputs of said receivers to a common value in the absence of an obstacle on the runway;

comparator circuit means coupled to said balance circuit means for generating a warning signal when the output of one or more of said receivers varies beyond a predetermined amount from said common value due to the presence of an obstacle on the runway; and

light indicator means responsive to said warning signal for providing an indication that an obstruction is present on the runway.

4,481,517
ECHOMETRY DEVICE AND METHOD

Edmund H. Brown, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed May 7, 1981, Ser. No. 261,415

Int. Cl.³ G01J *9/00*

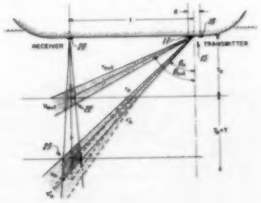
U.S. Cl. 343—5 NA **36 Claims**

10. A device for remotely measuring temperature, said device comprising:

transmitting means for transmitting pulses, said transmitting means including a transmitting array having a plurality of transducers for directionally transmitting said pulses in a manner such that constructive interference fringes are formed along the path of said transmitted pulses, said transmitting means including wave shaping means for causing transmission of one of acoustic and electromagnetic pulsed waves;

antenna means for receiving scattered segments of said transmitted pulses from at least one point of said constructive interference fringes remote from said transmitting means and providing and analog output indicative thereof;

signal processing means having an analog receiver means and analog-to-digital sampling means, said analog receiver means being connected with said antenna means to receive said analog output therefrom, and said analog-to-digital sampling means being connected with said analog receiver



means for sampling said analog signal and providing a digital output signal, said signal processing means determining the mean phase of said received analog output signal; and

digital signal processing means connected with said analog-to-digital sampling means to receive said digital signal therefrom and responsive thereto determining temperature at said remote point.

4,481,518
TRANSFER TYPE HEAT-SENSITIVE RECORDING DEVICE

Toshiharu Inui; Fujio Moriguchi, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 423,779

Claims priority, application Japan, Sep. 25, 1981, 56-150530

Int. Cl.³ G01D *15/10*; B41J *13/02*

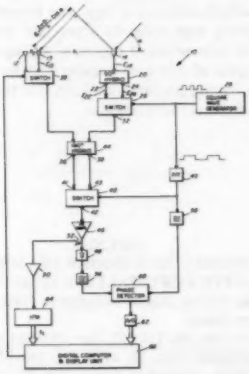
U.S. Cl. 346—76 PH **4 Claims**

1. A heat sensitive transfer type recording device comprising a thermal head having heat generating elements, a backing roll operatively positioned relative to said heat generating elements to provide for the passage of an ink donor sheet and a recording sheet therebetween under pressure, a separation roll disposed downstream of said thermal head relative to the direction of movement of said sheet and spaced from said backing roll, said thermal element and said separation roll being so mounted relative to said backing roll that the pressure exerted on said sheets between said separation roll and said backing roll will be less than the pressure exerted on said sheets between said thermal element and said backing roll.

4,481,519
RADIO FREQUENCY SIGNAL DIRECTION FINDING APPARATUS

Donald L. Margerum, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 318,493, Nov. 5, 1981, abandoned, which is a continuation of Ser. No. 106,117, Dec. 21, 1979, abandoned. This application Feb. 3, 1983, Ser. No. 463,683
Int. Cl.³ G01S 5/04
U.S. Cl. 343—434 5 Claims



1. A system for determining the difference in phase between a pair of radio frequency signals comprising:

(a) means, responsive to a periodic square wave signal having a fundamental frequency component, for periodically changing the phase of a first one of the pair of radio frequency signals $n\pi/2$ radians, where n is an integer, each quarter cycle of the periodic square wave signal, such means including means for combining such periodically phase changing signal with a second one of the pair of radio frequency signals to produce a composite radio frequency signal;

(b) means, responsive to the composite radio frequency signal, for producing a detected electrical signal having as a fundamental frequency component the fundamental frequency component of the periodic square wave signal, the relative phase between the fundamental frequency component of the periodic signal and the fundamental frequency component of the detected electrical signal being related to the difference in phase between the pair of radio frequency signals; and

(c) means, responsive to the periodic square wave signal and the detected electrical signal, for determining the relative phase difference between the fundamental frequency components of the periodic square wave signal and the detected electrical signal.

4,481,520
ELECTROOSMOTIC INK PRINTER HEAD

Hiroshi Esaki, Neyagawa, and Tadao Kohashi, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 31, 1983, Ser. No. 462,631
Claims priority, application Japan, Feb. 3, 1982, 57-16021; Jun. 7, 1982, 57-97936
Int. Cl.³ G01D 15/16
U.S. Cl. 346—140 R 16 Claims

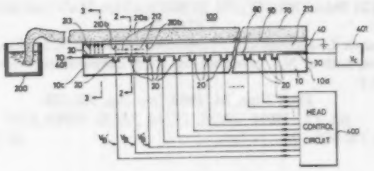
1. An electroosmotic ink printer head comprising:

a dielectric support having a surface defined by front and rear sides and a pair of opposite ends;

an array of first electrodes successively arranged on said surface and extending rearwardly from said front side;

a porous member overlying said first electrodes in contact with said surface and having a front edge spaced from said front side of the support;

a second, liquid-permeable electrode on said porous member;



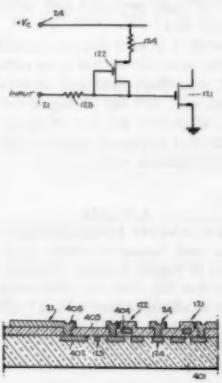
means for supplying ink to said porous member through said second electrode; and

a third electrode located adjacent to each end of said array of first electrodes and to said front side of the support.

4,481,521
INSULATED GATE FIELD EFFECT TRANSISTOR PROVIDED WITH A PROTECTIVE DEVICE FOR A GATE INSULATING FILM

Koichiro Okumura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 091,402, Nov. 6, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 295,367
Claims priority, application Japan, Nov. 6, 1978, 53-136570
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23 10 Claims



1. An insulated-gate field effect transistor device comprising:

an operative insulated-gate field effect transistor having a predetermined threshold voltage,

a protective insulated-gate field effect transistor having a threshold voltage substantially equal to said predetermined threshold voltage, whose drain and gate are coupled to the gate of said operative transistor,

a first resistive element coupled at one end to the gate of said operative transistor, the other thereof forming an input terminal and said first resistive element having a resistance value which is equal to or greater than the value of the dynamic resistance of the conducting source-drain path of the protective transistor and

a second resistive element connected at one end to the source of said protective transistor, the resistance value of said second resistive element being much smaller than said dynamic resistance and the other end of said second resis-

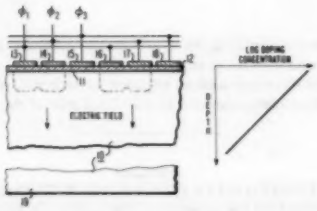
tive element being coupled to a terminal for connection to a voltage source.

4,481,522

CCD IMAGERS WITH SUBSTRATES HAVING DRIFT FIELD

Lubomir L. Jastrzebski, Plainsboro, and Peter A. Levine, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 24, 1982, Ser. No. 361,228
Int. Cl.³ H01L *29/78, 27/14, 31/00;* **H04N** *9/07*
U.S. Cl. 357—24 **16 Claims**



16. A method for causing differences in the spectral responses of different portions of a region of a photosensitive semiconductor substrate, which regions parallels a surface of said substrate, said method comprising the steps of:

inducing charge carrier collecting depletion regions of various depths in said substrate surface, said depths differing in like amounts as the depths to which various spectral components of light penetrate into said photosensitive semiconductor, and

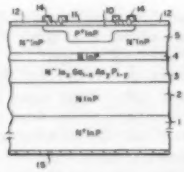
having introduced a graded doping concentration in said semiconductor substrate normal to its surface for creating a drift field, on which field said depletion regions are superimposed, said drift field being of sufficient strength to prevent a substantial fraction of charge carriers originating outside said depletion regions from ever diffusing to any of said depletion regions.

4,481,523

AVALANCHE PHOTODIODES

Fukunobu Osaka, and Tatsunori Shirai, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 30, 1981, Ser. No. 326,119
Claims priority, application Japan, Dec. 2, 1980, 55-169889
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **14 Claims**



1. An avalanche photodiode comprising:

a light absorbing semiconductor layer containing at least one impurity of a first conductivity type;

a middle semiconductor layer formed on said light absorbing semiconductor layer and being lattice matched with said light absorbing semiconductor layer, said middle semiconductor layer having a larger band gap than said light absorbing semiconductor layer, said middle layer containing at least one impurity of said first conductivity type in a first concentration; and

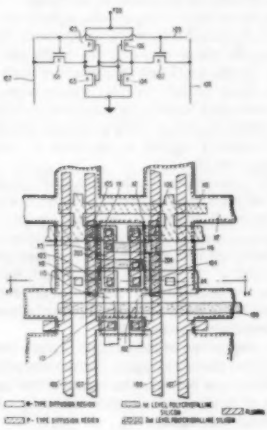
an active semiconductor layer formed on said middle semiconductor layer and being lattice matched with said middle semiconductor layer, said active semicondutor layer having a larger band gap than said light absorbing semiconductor layer, said active semiconductor layer containing at least one impurity of said first conductivity type in a second concentration less than said first concentration, said active semiconductor layer having a light sensitive region which contains at least one impurity of a second conductivity type different from said first conductivity type, said light sensitive region being separated from the other region of said active semiconductor layer by a p-n junction having gradually inclined side thereof surrounding said light sensitive region.

4,481,524

SEMICONDUCTOR MEMORY DEVICE HAVING STACKED POLYCRYSTALLINE SILICON LAYERS

Tohru Tsujide, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 114,162, Jan. 22, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,018
Claims priority, application Japan, Jan. 23, 1979, 54-6925
Int. Cl.³ H01L *27/02, 29/34, 29/04;* **G11C** *11/00*
U.S. Cl. 357—42 **15 Claims**



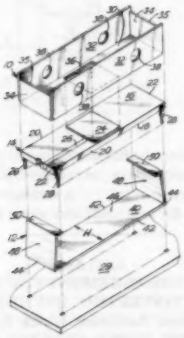
1. A semiconductor memory device comprising a plurality of memory cells having a pair of transistors having commonly connected sources and a gate transistor, a lower wiring layer formed of polycrystalline silicon and comprising the gates of said pair of transistors and said gate transistor and word lines for the respective memory cells coupled to the gates of the gate transistors, an upper wiring layer formed of highly conductive material and including interconnections for electrically connecting the respective gate of each one of said pair of transistors to the respective drain of each other of said pair of transistors and digit lines for each memory cell coupled to one of the source and the drain of said gate transistor, and another upper wiring layer formed of polycrystalline silicon positioned to substantially cover said lower polycrystalline silicon layer in the region of said gates and serving as a power supply path to said pair of transistors.

4,481,525

HEAT DISSIPATOR FOR INTEGRATED CIRCUIT CHIPS

Anthony D. Calabro, 8738 West Chester Pike, Upper Darby, Pa. 19082, and Richard J. Marchetti, Norristown, Pa., assignors to Anthony D. Calabro, W. Chester, Pa.

Filed Aug. 12, 1982, Ser. No. 407,348
Int. Cl.³ H01L *23/36, 23/40, 23/04*
U.S. Cl. 357—81 **13 Claims**



1. A heat dissipator for use with an integrated circuit chip, said chip being a substantially rectangular structure having opposed top and bottom surfaces, said heat dissipator comprising:

a radiator chimney including a substantially rectangular top contact plate having opposed side and end edges and opposed pairs of substantially rectangular upstanding side and end walls extending from and connected to said side and end edges of said top contact plate respectively, said side and end walls of said radiator chimney defining a substantially rectangular tubular chimney structure; and

a heat conducting clamp including a substantially rectangular bottom contact plate having opposed side and end edges, a pair of substantially upstanding end arms extending from and connected to said opposed end edges of said bottom contact plate, and a pair of clamping flanges connected respectively to said end arms, said clamping flanges extending toward one another and being spaced from said bottom contact plate a sufficient distance to enable said clamping flanges to engage said end wall when said radiator chimney and said heat conducting clamp are disposed on opposite sides of said chip, whereby when said top and bottom contact plates are placed into face-to-face contacting relationship with said top and bottom surfaces of said chip, said end arms and said clamping flanges clamp into face to face engagement with said end walls thereby clamping said radiator chimney and said heat conducting clamp onto said chip.

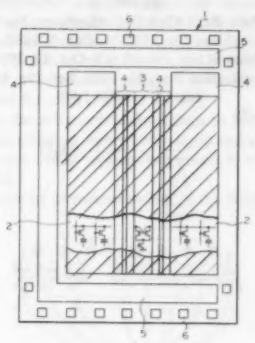
4,481,526

SEMICONDUCTOR DEVICE

Kiyoshi Miyasaka, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 17, 1981, Ser. No. 274,542
Claims priority, application Japan, Jun. 17, 1980, 55-81953
Int. Cl.³ H01L *25/04, 23/28, 29/34, 27/12*
U.S. Cl. 357—84 **12 Claims**

1. A semiconductor device comprising: a chip made of a semiconductor substrate and memory circuits, including memory cells and sense amplifiers, fabricated in said chip; and a resinous film formed on said chip for shielding radioactive rays, said film being divided into a plurality of portions, wherein said portions are separated from one another for forming at least one separation area, and coat at least said memory cells and said sense amplifiers.

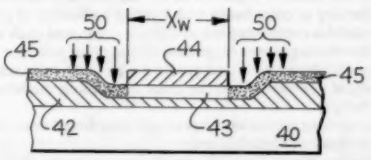


4,481,527

HIGH DENSITY MNOS TRANSISTOR WITH ION IMPLANT INTO NITRIDE LAYER ADJACENT GATE ELECTRODE

Yung J. Chen, Weston, Mass., and Rick K. Hodgman, Palos Verdes Peninsula, Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation of Ser. No. 265,698, May 21, 1981,. This application May 26, 1983, Ser. No. 489,461
Int. Cl.³ H01L *29/78, 29/34*
U.S. Cl. 357—23 **6 Claims**



1. In a metal nitride oxide semiconductor (MNOS) dual threshold memory transistor comprising:

a semiconductor substrate comprising silicon of a first conductivity type;

a pair of spaced source and drain diffusion regions of a second conductivity type formed in the substrate, the diffusion regions being separated by an interstitial portion of said substrate and sharing a common boundary therewith;

a layer of oxide material adhered to the common boundary surface said oxide layer comprising a silicon dioxide layer having a central memory region having a thickness of less than about 4 nanometers located atop the interstitial portion and surrounding oxide regions of substantially greater thickness;

a layer of silicon nitride material adhered to said oxide layer;

an electrically conductive gate electrode adhered to the silicon nitride layer overlying the central memory region of the oxide layer;

the improvement comprising the addition of ion implanted ions of the first conductivity type into and no deeper than the silicon nitride layer in those portions thereof adjacent to the gate electrode such that the implantation of the ions into those regions of the silicon nitride layer beneath the gate electrode is effectively blocked by the gate electrode.

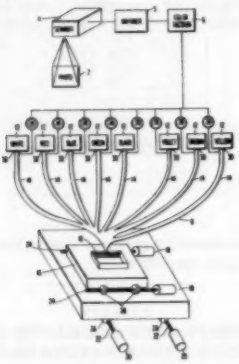
4,481,528
MULTICOLOR IMAGE PRINTING DEVICE AND METHOD

Richard M. Peck, 3113 Club Dr., Allentown, Pa. 18103

Continuation of Ser. No. 195,281, Oct. 8, 1980, abandoned, which is a division of Ser. No. 85,665, Oct. 17, 1979, abandoned. This application Nov. 18, 1982, Ser. No. 451,364

Int. Cl.³ H04N 1/46

U.S. Cl. 358—75 **36 Claims**



1. An apparatus for making a color image printing device comprising a scanning means for scanning the representation to be printed and generating a scanning signal responsive thereto;

a color selection means having an input means for receiving said scanning signal and means responsive to said scanning signal to generate a color selection signal corresponding to the color of a portion of the scanned representation;

a plurality of color banks each holding a plurality of printing modules comprising ink of a single color, and each having distributing means responsive to said color selection signal to distribute one of said modules when said color selection signal corresponds to the color of printing modules held therein;

a composing means to compose said distributed modules into an array of modules; and

a binding means for binding said array whereby said bound array can be applied to a surface and the ink in said printing modules will produce at least one image corresponding to said representation.

4,481,529
TRICOLOR VIDEO SIGNAL GENERATOR, SUCH AS A VIDEO GAME, USABLE WITH A MONOCHROME PICTURE DISPLAY DEVICE

Jean-Marie Kerling, Nanterre, France, assignor to U.S. Philips Corporation, New York, N.Y.

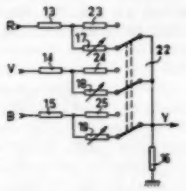
Filed May 27, 1982, Ser. No. 382,736

Claims priority, application France, Jun. 1, 1981, 81 10767

Int. Cl.³ H04N 9/52

U.S. Cl. 358—30 **5 Claims**

1. A tri-color video signal generator having a signal output for connecting said generator to the antenna input of a color or a black and white standard television receiver, said generator comprising inter alia a circuit producing red (R), green (V) and blue (B) color signals, and a resistive matrix network having branches to which said color signals are applied, respectively, for deriving a luminance signal from said color signals, characterized in that each of the branches of said resistive matrix network which receive the signals R, V, B, comprises a variable resistor, a fixed resistor arranged in parallel with said variable resistor, switching means for selectively coupling said fixed or said variable resistor to said luminance output, and a manual control, coupled to at least said switching means, for modifying the respective ratios between the color signals R, V, B in the luminance signal, said manual control having a first and a second setting wherein, in said first setting, the R, V,



B-ratio for generating the luminance signal corresponds to that required for said color television receiver, while, in said second setting, the RVB-ratio results in a luminance signal having a grey-scale suitable for said black and white television receiver.

4,481,530
COLOR FILTER ARRANGEMENT FOR OPTOELECTRIC CONVERTING DEVICES

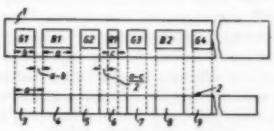
Eduard Wagensonner, Aschheim; Ulrich Krekeler, Penzberg, and Wolfgang Ruf, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 380,014

Claims priority, application Fed. Rep. of Germany, May 26, 1981, 3120849

Int. Cl.³ H04N 9/04

U.S. Cl. 358—44 **6 Claims**



1. A color filter arrangement for an optoelectric converting device, preferably a charge-coupled photoelectric device including a plurality of uniformly shaped photoelectric converting elements arranged side-by-side in a series and being sensitized to green, blue, green and red colors and by means of which a received optical image is converted into corresponding electric picture-point signals, the signals being processed in a video system in the predetermined order of green, blue, green and red picture-point signals, the filter arrangement comprising a transparent filter carrier superposed on said photoelectric converting elements; a plurality of color filtering elements arranged one after the other in said predetermined green, blue, green and red sequence on said carrier opposite the corresponding photoelectric converting elements; the surface area of said blue filtering elements being equal to or smaller than the surface area of the opposite blue-sensitive photoelectric converting elements; the surface areas of respective red and green filtering elements being smaller than the surface areas of the blue filtering elements in proportion to the difference in the spectral sensitivites of the photoelectric converting elements; and opaque masking means provided on said carrier, said masking means defining opaque webs between the consecutive filtering elements, the webs corresponding in width to the size differences between respective filtering elements and the assigned photoelectric converting elements.

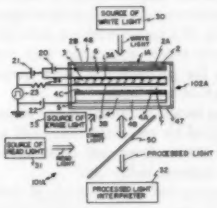
4,481,531
MICROCHANNEL SPATIAL LIGHT MODULATOR

Cardinal Warde, Cambridge, and Jeffrey H. Shapiro, Sharon, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 848,179, Nov. 3, 1977, abandoned. This application Jan. 13, 1984, Ser. No. 569,944

Int. Cl.³ H04N *9/31;* **G02F** *1/13;* **H01J** *31/50, 43/00*

U.S. Cl. 358—60 **24 Claims**



23. A microchannel spatial light modulator to modulate at least one of the phase and intensity of incoming light, that comprises: microchannel plate means positioned to receive the incoming light and operable to generate photoelectrons in the form of an electron image, which image is amplified by the channels of the microchannel plate to provide an amplified electron image; electro-optic plate means coated on one side thereof with a dielectric mirror and a light-blocking layer to receive the thusly amplified electron image and on the other side thereof with a transparent electrode; means for applying a bias potential to said transparent electrode, said transparent electrode serving when an electric bias potential is applied thereto, to bias the electro-optic plate means.

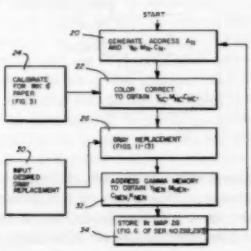
4,481,532
METHOD OF DETERMINING AND STORING COLOR PRINTING INFORMATION

David A. Clark, Streamwood, and Barbara J. Boyer, Chicago, both of Ill., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Continuation-in-part of Ser. No. 393,054, Jun. 28, 1982, abandoned. This application Jul. 8, 1982, Ser. No. 396,247

Int. Cl.³ H04N *1/46*

U.S. Cl. 358—80 **22 Claims**


START
GENERATE ADDRESS Ag AND Yg, Mg, Cg
CALIBRATE FOR INC. & PAPER (FIG. 3)
COLOR CORRECT TO OBTAIN
GRAY REPLACEMENT (FIGS. 11-13)
INPUT DESIRED GRAY REPLACEMENT
ADDRESS GAMMA MEMORY TO OBTAIN
STORE IN MAP 28 (FIG. 6 OF DES NO.258,326)

1. A method of determining and storing color printing information in a memory of a color reproduction system from a set of values representing colors in an input color space, comprising the steps of:

(a) scanning a plurality of samples of a gray scale with a color separation scanner to obtain a set of scanned values representing the density values of each color component for each sample;

(b) determining the engraving values for each color component of each sample of the gray scale;

(c) plotting a gamma curve for each color component of the gray scale samples, the gamma curves including points defined by the intersection of the scanned value of one color component with an engraving value of the same color component for each gray scale sample;

(d) determining from the gamma curves the amount of correction required to reproduce a set of colors utilizing a particular set of inks and paper to generate color correction values for each color of the set;

(e) utilizing the color correction values to modify the set of values representing colors in the input space to generate a set of second values representing colors in an output color space; and

(f) storing the set of second values in the memory.

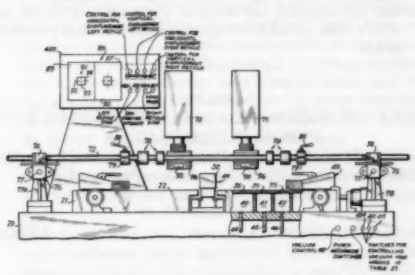
4,481,533
METHOD AND APPARATUS FOR SUCCESSIVELY POSITIONING SHEETS OF MATERIAL WITH PRECISION FOR PUNCHING ALIGNING HOLES IN THE SHEETS ENABLING THE SHEETS TO BE USED IN THE MANUFACTURE OF COMPOSITE CIRCUIT BOARDS

Donald R. Alzmann; Michael Angelo, both of East Islip, and Paul R. Waldner, Wantagh, all of N.Y., assignors to Lenkeit Industries, Inc., Long Island City, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,566

Int. Cl.³ H04N *7/00*

U.S. Cl. 358—101 **22 Claims**

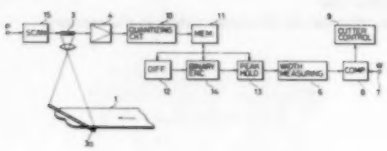


1. Apparatus for effecting operations on sheets of material at precise locations thereon, each sheet having marking means thereon, said apparatus comprising receiver means for receiving sheets one by one and for holding said sheets in fixed position, operating means for effecting an operation on said sheets at precise locations thereon, optical means for viewing each sheet to detect the marking means thereon, display means for visually displaying the marking means on each sheet, means for producing an index positioning means on said display means, means for moving said index positioning means on said display means to establish a fixed relation between said index positioning means and said operating means, and means for adjustably moving said receiver means to align the marking means on each sheet, as viewed on the display means, with the index positioning means thereon, said optical means comprising a video camera and said display means comprising a video tube, said index positioning means comprising a reticle and said means for producing the index positioning means comprises electronic means for electronically producing said reticle on said video tube.

4,481,534
CONFIGURATION DETECTING DEVICE

Toyokazu Saito; Seietsu Sanmiya; Akio Hosooka, all of Aichi; Kazuo Takashima, and Minoru Tanaka, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Steel Corporation, both of, Japan

Filed Apr. 27, 1982, Ser. No. 372,354
Claims priority, application Japan, Apr. 29, 1981, 56-66037; Apr. 29, 1981, 56-66038
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 13 Claims

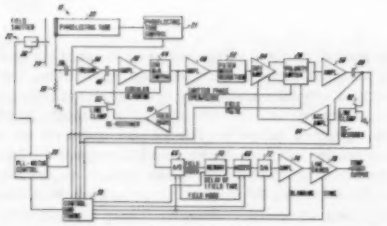


1. A configurationn detecting device comprising:
a detecting means for forming an image of an object and producing a scanning signal;
scanning means for controlling a scanning interval of said detecting means according to a movement distance of said object;
means for quantizing a detection signal provided by said detecting means in multiple-levels;
memory means for storing a multi-level signal provided by said quantizing means;
means for differentiating said multilevel signal stored in said memory means;
means for binary-encoding a differentiation signal provided by said differentiating means;
means for subjecting a binary-encoded signal provided by said binary-encoding means to peak-holding; and
means for obtaining the width of a scanned portion of said object from a peak hold signal provided by said peak hold means.

4,481,535
SIGNAL PROCESSING SYSTEM FOR CHOPPER TYPE PYROELECTRIC CAMERA

Donald E. Hodd, Niwot, and Hans R. Bucher, Boulder, both of Colo., assignors to Xedar Corporation, Boulder, Colo.

Filed Aug. 9, 1982, Ser. No. 406,150
Int. Cl.³ H04N 5/33
U.S. Cl. 358—113 4 Claims

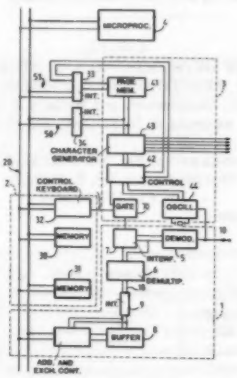


1. A signal processing system for a pyroelectric camera having a pyroelectric vidicon tube and a shutter positionable in the optical path of said pyroelectric vidicon tube, said system comprising:
input means for receiving the output signal from said pyroelectric vidicon tube, said output signal including a first field arising from imaging of a target by said pyroelectric vidicon tube and a second field arising from blanking of imaging of a target by said shutter, with said outputs signal indicative of each said field including pedestal components generated during flyback that have an amplitude greater than signal components due to imaging of targets by said pyroelectric vidicon tube;
pedestal removal means including amplifier means connected to said input means to receive said output signals therefrom, circular blanking means connected with said amplifying means, and feedback means connected from the output of said circular blanking means to the input of said amplifying means whereby said pedestal removal means provides an output signal for each field from said pyroelectric vidicon tube that includes signal components due to imaging of a target without pedestal components;
polarity switching means connected with said pedestal removal means for providing a unity output signal with respect to each of said fields;
signal combining means including delay means for delaying a received signal by one field time, and a combiner for receiving the output from said delay means and the received signal without delay; and
output means connected with said signal combining means for providing a composite video signal output suitable for display of targets imaged by said pyroelectric vidicon tube.

4,481,536
TELETEXT SYSTEM FOR DISPLAYING DATA ON THE SCREEN OF A TELEVISION RECEIVER

Charles Hernandez, Villejuif, France, assignor to Compagnie Continentale de Signalisation, Orly, France

Filed May 26, 1982, Ser. No. 382,236
Int. Cl.³ H04N 7/04
U.S. Cl. 358—147 3 Claims



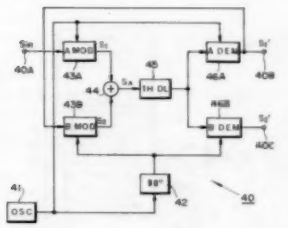
1. Teletext system for displaying data, diffused in the form of multiplexed channels, on the screen of a television receiver, comprising, at reception, a data demodulator, a demultiplexer connected to the demodulator, means containing the characters to be displayed connected to means for displaying these characters on the television screen and to means for controlling these display means, the demodulator and the demultiplexer being connected via phasing flip flops, and means adapted to produce data transmission windows and to cut off transmission of data from the demodulator to the demultiplexer outside these transmission windows, comprising a first gate adapted to return the flip flops to zero, this first gate being controlled by means for controlling the display means and a second gate, for the passage of a clock signal furnished by the demodulator, this second gate being controlled by the first gate.

4,481,537

APERTURE CORRECTION CIRCUIT

Sadaaki Tanaka, Hadano, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,002
Claims priority, application Japan, Jul. 9, 1981, 56-107397; Jul. 9, 1981, 56-107396; Jul. 9, 1981, 56-102152[U]
Int. Cl.³ H04N 5/14
U.S. Cl. 358—162 13 Claims



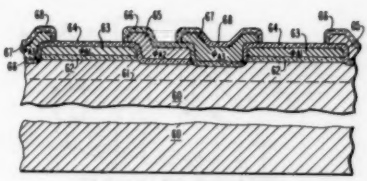
1. A video signal processing circuit, comprising first modulating means for modulating a first modulating carrier which has a first phase angle and is modulated by an input video signal to produce a first modulated video signal, second modulating means for modulating a second modulating carrier which has a phase angle in quadrant to said first phase angle and the same frequency as said first modulating carrier and which is modulated by an input signal to produce a second modulated video signal, mixing means for adding said first and second modulated video signals together and producing a mixed video signal, delay means for delaying said mixed video signal for a predetermined duration and producing a delayed output signal, first demodulating means for demodulating said delayed output signal in accordance with a first demodulating carrier which has the same phase angle as said first modulating carrier and provides a first demodulated output signal which forms said input signal to said second modulating means and which is delayed by approximately said predetermined duration relative to said input video signal, second demodulating means for demodulating said delayed output signal in accordance with a second demodulating carrier which has the same phase angle as said second modulating carrier and provides a second demodulated output signal which is delayed by approximately twice said predetermined duration relative to said input video signal, first oscillating means for providing said first and second modulating carriers and second oscillating means for providing said first and second demodulating carriers, control means for controlling the phase of said first and second demodulating carriers by supplying a control signal to said second oscillating means in response to a first reference signal and said first demodulated output signal, said control means comparing the level of said first reference signal to the level of said first demodulated output signal and providing said control signal in accordance with said comparison, and wherein said second modulating means is modulated by said first demodulated output signal and a second reference signal, having a second phase angle, which is superposed on said first demodulated output signal by an adding means during a portion of the horizontal blanking period of said input video signal.

4,481,538

OVERCOMING FLICKER IN FIELD-INTERLACED CCD IMAGERS WITH THREE-PHASE CLOCKING OF THE IMAGE REGISTER

Donald F. Battson, Landisville, and Eugene D. Savoye, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 428,589
Int. Cl.³ H01I 11/14
U.S. Cl. 358—213 8 Claims



1. A camera system for generating video signals with field interlacing responsive to received radiant energy images, with substantially reduced alternate-field flicker, said camera system comprising:

a CCD imager of field transfer type having an image register with first, second and third sets of gate electrodes cyclically disposed in parallel perpendicular to its charge transfer channels, a first storage register and at least one parallel-to-series-data-converting read-out register followed by a charge-sample-to-video-signal conversion stage;

means for focussing said radiant energy images on the image register of said CCD imager;

a processing amplifier for receiving video signal from each charge-sample-to-video-signal conversion stage; and

means for supplying clocking signals to said processing amplifier and to said CCD imager register, including

means for supplying first and second and third phases of a three-phase clocking signals, respectively, to the first and second and third sets of electrodes in the image register of said CCD imager during field transfer times, said field transfer times being between adjoining image integration times consecutively numbered with respect to an arbitrarily chosen reference image integration time,

means for halting said three-phase clocking during each odd-numbered image integration time so that charge integration occurs only near the first set of gate electrodes, and

means for halting said three-phase clocking during each even-numbered image integration time so that charge integration occurs only under the second and the third sets of gate electrodes; and

the improvement wherein the length of each gate electrode in said first set of image register gate electrodes is substantially equal to the sum of the lengths of the gate electrodes in said second and third sets.

4,481,539

ERROR CORRECTION ARRANGEMENT FOR IMAGERS

William H. Meise, Wrightstown, Pa., and Robert A. Dischert, Burlington, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 242,268, Mar. 10, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,634
Int. Cl.³ H04N 5/36, 5/21
U.S. Cl. 358—213 10 Claims

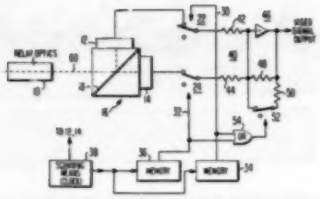
1. An imaging apparatus comprising:

a pair of imagers for imaging a scene, one of said imagers being mounted upside-down relative to the other imager, each imager having a plurality of discrete photosensors, said photosensors being subject to defects;

means for obtaining signals from the discrete photosensors

of each of said imagers to allow producing a visible image, whereby portions of said signals are not representative of the scene due to said defects; and

means for adding corresponding portions of said signals obtained from said imagers for producing a combined signal having improved signal-to-noise ratio resulting from adding corresponding portions of said signals which are representative of corresponding portions of said scene, and also having a reduced magnitude of error resulting from adding portions of one of said signals which are not



representative of the scene due to said defects with corresponding portions of the other of said signals which are representative of corresponding portions of said scene, wherein said obtaining means comprises means for synchronously scanning said one of said imagers backwards relative to the other imager for simultaneously obtaining signals from each of said imagers having corresponding portions representative of signal from discrete photosensors having corresponding portions of said scene imaged thereon.

4,481,540

TELEVISION CAMERA COMPRISING A FOCUSING ARRANGEMENT

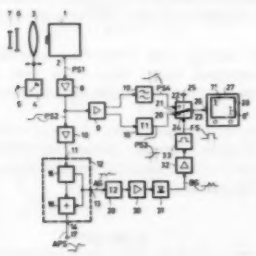
Franciscus H. M. Bergen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,086

Claims priority, application Netherlands, Jun. 26, 1981, 8103090

Int. Cl.³ H04N *5/26, 5/30*

U.S. Cl. 358—227 **5 Claims**



1. A television camera comprising a focusing arrangement, a television pick-up device and an electronic view-finder which has a signal input which is coupled to an output of the pick-up device for supplying a picture signal, the view-finder incorporating a display screen for displaying the applied picture signal, characterized in that the said output of the pick-up device for supplying the picture signal is coupled to the signal input of the view-finder via a switching device, the switching device having a switching input which is coupled to an output for carrying an aperture correction signal provided by an aperture correction circuit incorporated in the camera, the switching device transmitting the picture signal during the presence of the aperture correction signal.

4,481,541

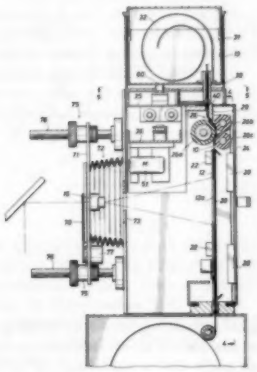
CAMERA FOR CRT MONITOR

Kostas P. Ioannidis, and David E. Stone, both of Houston, Tex., assignors to Radx Corporation, Houston, Tex.

Filed Feb. 7, 1983, Ser. No. 464,374

Int. Cl.³ H04N *5/84*

U.S. Cl. 358—244 **3 Claims**



1. A camera for photographing the image on a CRT monitor comprising a housing, a CRT monitor mounted in the housing, a magazine for holding a roll of film, a vertical aperture plate mounted above the magazine, a pressure plate for holding the film against the aperture, magnetic means for urging the pressure plate and the aperture plate together with sufficient force to hold the film flat against the aperture plate while allowing the film to be moved between the aperture plate and the pressure plate, a lens and shutter assembly positioned to focus the image on the CRT monitor on the film through the aperture of the aperture plate when the shutter is open, a removable cassette mounted above the film magazine and the plate to receive the exposed film, and means for cutting the film between the film advancing means and the cassette to allow the cassette to be removed and the exposed film in the cassette to be developed while another cassette is being loaded with exposed film from the magazine.

4,481,542

COLOR VIDEO HARDCOPY RECORDER, METHOD AND MEDIA THEREFOR

Paul R. Goldberg, Palo Alto, Calif., assignor to Advanced Imaging Devices, Inc., Mountain View, Calif.

Filed Mar. 18, 1982, Ser. No. 359,605

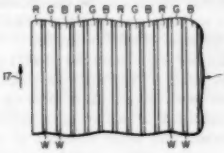
Int. Cl.³ H04N *9/49*

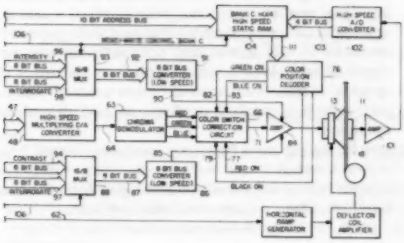
U.S. Cl. 358—331 **18 Claims**

1. A color video hard copy recorder in which a recording media having different areas for recording information representative of different colors is moved past a scanning light beam including

means for periodically scanning said recording media with

said light beam and providing signals identifying said different areas,





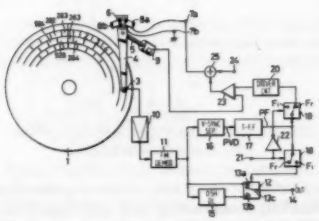
means for controlling said scanning responsive to said signals to record different color information at said corresponding areas.

4,481,543

PLAYBACK APPARATUS FOR PRODUCING STILL IMAGES

Etsuro Saito, Ayase, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 358,851
Claims priority, application Japan, Mar. 30, 1981, 56-47011
Int. Cl.[3] G11B *5/04, 5/008*
U.S. Cl. 360—10.1 **7 Claims**



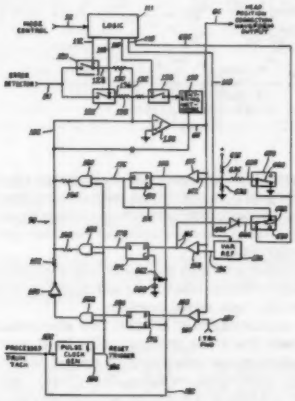
1. A still image playback apparatus comprising, a single playback head which can be controlled by a head positioning means and is mounted adjacent a disc-like recording medium which is rotated at a field frequency and has a plurality of concentric tracks and on each track video signals for one field period are recorded, said playback head movable by said head positioning means from one of said tracks to an adjacent track, so that video signals of one still frame image corresponding to two field periods of standard television signals are obtained during playback from said playback head when said recording medium is rotated twice, wherein said playback head moves between said one track to said adjacent track with a timing synchronous with the reproduction of a vertical sync signal of a standard television signal, and wherein said playback head moves during a vertical blanking interval of the standard television signal.

4,481,544

AUTOMATIC TRACKING SYSTEM WITH APPARATUS TO PREVENT MISTRACKING BY A LIMITED RANGE TRANSDUCER DURING STOP MOTION

Raymond F. Ravizza, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 18, 1981, Ser. No. 303,642
Int. Cl.[3] H04N *5/78*; G11B *21/10*
U.S. Cl. 360—10.2 **27 Claims**



19. In a magnetic tape recording/reproducing machine of the type having transducing means operatively supported by a rotatable means for scanning a magnetic tape along a plurality of adjacent discrete tracks oriented at an angle relative to the lengthwise direction of the tape, the rotatable means including means for moving the transducing means a limited dynamic distance in either of two opposite directions relative to a nominal position along a path generally transverse to the tracks in response to an error correcting signal being applied thereto, wherein the tape is transported in a forward direction during recording, an apparatus for providing a still frame reproducing mode wherein N consecutive tracks are reproduced repetitively, N being an integer greater than one, said apparatus comprising:

means for generating said error correcting signal such that the transducing means moves in a first transverse direction N track-to-track spacings in order to cause said transducing means to follow N consecutive tracks throughout their length;

means for generating a reset signal at the end of a scan of every track; and

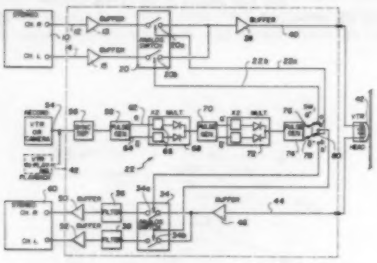
means for generating a reset command to said means for generating said error correcting signal causing said error correcting signal to vary such that the transducing means is moved in a second transverse direction, opposite to the first, N consecutive track-to-track spacings; wherein said reset command is generated substantially coincident with said reset signal when the position of the transducing means is greater than N track-to-track spacings away from said limited dynamic distance in said second direction.

4,481,545

STEREO APPARATUS FOR VTR WITH MONORAL AUDIO HEAD

Gregory Shim, 255-22 73rd Ave., Glen Oaks, N.Y. 11004

Filed Sep. 10, 1982, Ser. No. 416,583
Int. Cl.³ G11B *15/02, 15/12*
U.S. Cl. 360—18 **6 Claims**



1. An apparatus for processing an audio stereo signal having left and right signal portions for use with a video tape recorder having a monoral audio head and where a video signal terminal for supplying a video signal including at least one sync pulse is available, comprising:

an analog switch assembly having at least two electronically controlled switches, one for the left signal portion and the other for the right signal portion;

a line for connecting said at least two electronically controlled switches to the monoral audio head; and

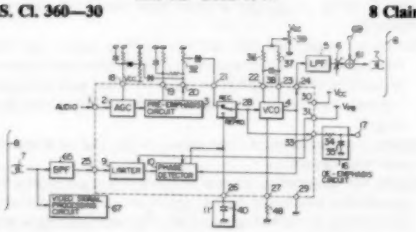
control switch means connected to said at least two electronically controlled switches for closing one of said switches at a time according to two control pulse trains, to pass incremental portions of the left and right signal portions, said switch control means adapted to be controlled to the video signal terminal and being operable to produce said control pulse trains from the at least one sync pulse, said switch control means having at least one multiplier therein for increasing a frequency of the sync pulse so that said two control pulse trains have a frequency which is at least twice a highest audio frequency of the stereo signal.

4,481,546

MODULATOR-DEMODULATOR FOR OBTAINING AND DEMODULATING FREQUENCY-MODULATED SIGNAL

Shigeyuki Ito, Yokohama; Yoshizumi Watatani, Fujisawa, and Hitoaki Owashi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 434,881
Claims priority, application Japan, Oct. 19, 1981, 56-165803; Jun. 30, 1982, 57-111709
Int. Cl.³ G11B *5/04*
U.S. Cl. 360—30 **8 Claims**



1. A modulator-demodulator for obtaining and demodulating a frequency-modulated signal and for performing a modulating operation and a demodulating operation time-sequentially, said modulating and demodulating operations using a circuit part in said modulator-demodulator in common, said modulator-demodulator comprising:

a voltage-controlled oscillator, the oscillation frequency of said oscillator varying in accordance with a signal applied to a control terminal of said oscillator;

a phase detector, one input terminal of said phase detector being applied with a frequency-modulated signal, the other input terminal of said phase detector being applied with the output signal of said voltge-controlled oscillator;

a switching circuit, one input terminal of said switching circuit being applied with a modulating signal, the other input terminal of said switching circuit being applied with the output signal of said phase detector, said switching circuit being operated in such a manner that said modulating signal applied to said one input terminal is selectively applied to said control terminal of said voltage-controlled oscillator in said modulating operation and said output signal of said phase detector applied to said other input terminal is selectively applied to said control terminal of said voltage-controlled oscillator in said demodulating operation;

means for taking out a frequency-modulated signal from an output terminal of said voltage-controlled oscillator; and

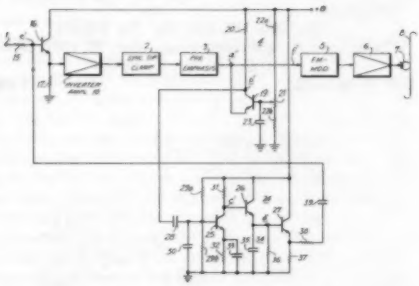
means for taking out a demodulated signal from the control terminal of said voltage-controlled oscillator.

4,481,547

VIDEO SIGNAL PROCESSING CIRCUIT

Ichitaro Sato, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,461
Claims priority, application Japan, Apr. 6, 1981, 56-51323
Int. Cl.³ H04N *5/78, 5/21*
U.S. Cl. 360—33.1 **10 Claims**



1. An apparatus for processing a video signal comprising:

pre-emphasizing means acting on a video signal for providing a pre-emphasized video signal as an output therefrom;

level clip means for clipping said pre-emphasized video signal at a predetermined level; and

means compensating for any waveform distortions of the output of said clip means that result from said output of the pre-emphasizing means being beyond said predetermined level including means connected with said level clip means for providing a pulse indicating each overshoot of said pre-emphasized video signal beyond said predetermined level with each said pulse having an amplitude corresponding to the amount of the respective overshoot beyond said predetermined level, means for integrating each said pulse so as to provide a respective widened pulse of a width corresponding generally to said amplitude of the respective overshoot indicating pulse, and means for superimposing each said widened pulse on the video signal in advance of said pre-emphasizing means.

4,481,548

MAGNETIC RECORDING AND REPRODUCING APPARATUS

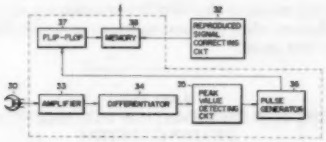
Tuneo Yanagida, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 308,828, Oct. 5, 1981,. This application Sep. 9, 1983, Ser. No. 531,184

Claims priority, application Japan, Oct. 17, 1980, 55-145116

Int. Cl.³ G11B *5/09, 5/00*

U.S. Cl. 360—44 **6 Claims**



1. A magnetic recording and reproducing apparatus comprising:

means for converting an analog input signal to a digital signal;

means for pulse-duration-modulating said digital signal to produce an original pulse-duration-modulated signal, said original pulse-duration-modulated signal not being on a carrier signal;

a magnetic recording head for recording said original carrierless pulse-duration-modulated signal on a recording medium of perpendicular magnetic anisotropy wherein said recording head perpendicularly magnetizes the recording medium in correspondence with said original pulse-duration-modulated signal;

a reproducing head for reproducing the pulse-duration-modulated signal recorded on said recording mdium by said recording head;

a differentiator coupled to said reproducing head for differentiating the pulse-duration-modulated signal reproduced by said reproducing head and for futher providing a differentiated signal having peak values;

a peak value detector coupled to said differentiator for detecting the peak values of the differentiated signal from said differentiator and for generating a peak value signal; and

means coupled to said peak value detector for modulating said peak value signal generated by said peak value detector to obtain the original pulse-duration-modulated signal.

4,481,549

MFM DATA ENCODER WITH WRITE PRECOMPENSATION

John G. Theus, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 74,600, Sep. 12, 1979, Pat. No. 4,334,250, which is a continuation of Ser. No. 887,403, Mar. 16, 1978, abandoned. This application Dec. 22, 1980, Ser. No. 219,048

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.³ G11B *5/09*

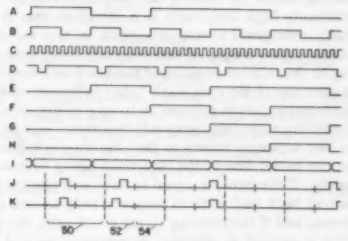
U.S. Cl. 360—45 **8 Claims**

1. An encoding circuit for converting an input stream of serial data bits to an MFM encoded output stream of serial data bits with write precompensation; said encoding circuit comprising:

means for converting the input stream of serial data bits to parallel bits;

memory means for storing therein addressable data words from which said encoded output is to be formed, each said data word representing an input bit in MFM encoding and at least one of said data words additionally including write precompensation encoding, the input of said memory means being coupled to said converting means whereby said data words are addressable by said parallel data bits;

said memory means being arranged such that for each parallel data bit a said data word representing it is made available at the output of said memory means, said word being selectable from those which include precompensation encoding when the context of said parallel data bit so requires;



means coupled to the output of said memory means for converting said addressable data words from parallel to serial form providing the output stream of serial data bits; and

means for controlling the transfer of said addressable data words from said memory means to said parallel-to-serial converter means.

4,481,550

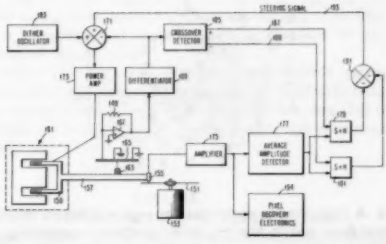
METHOD AND APPARATUS FOR FOLLOWING A RECORDED DATA TRACK WITH A READ HEAD

Armin Miller, Palo Alto, and Lauren V. Merritt, Los Altos, both of Calif., assignors to Datacopy Corporation, Mountain View, Calif.

Filed Apr. 26, 1982, Ser. No. 371,862

Int. Cl.³ G11B *5/58, 21/10*

U.S. Cl. 360—77 **15 Claims**



1. Apparatus for following, with a reading head, a data track recorded on a recording medium comprising:

a recording medium on which information has been recorded on a data track;

a playback head;

recording medium-moving means for moving said recording medium with respect to said playback head to thereby allow said playback head to read the information recorded on said data track, said playback head having an output for carrying an electical signal representative of information recorded on said data track;

playback head-moving means for moving said playback head across said recording medium, in a direction that is substantially orthogonal to said data track;

velocity detector means for providing an electrical output which bears a direct relationship to the relative velocity of said playback head-moving means;

summing means connected to said velocity detector means, the output of said summing means being connected to said playback head-moving means to thereby drive said playback head-moving means to close a velocity loop around said playback head-moving means;

amplitude-detector means connected to said output of said playback head for providing, at an output of said amplitude detector means, a derived amplitude signal which is substantially the average amplitude of the signal output of said playback head;

dithering means for causing said playback head to vibrate at relatively high frequency in a direction that is substantially orthogonal to said data track, so that the amplitude of said signal output of said playback head varies according to the relative position of the head with respect to the center line of the data track being followed; and,

demodulation means responsive to said dithering means for providing a steering signal which acts as a velocity request to said summing means so that the playback head is kept on the center line of the data track being followed;

whereby, if the steering signal is zero, said playback head is moved back and forth in response only to said dithering means, and if the steering signal is not zero, the playback head is moved in addition in response to said velocity request in the appropriate direction until said steering signal is zero.

4,481,551

MAGNETIC RECORDING AND REPRODUCING APPARATUS

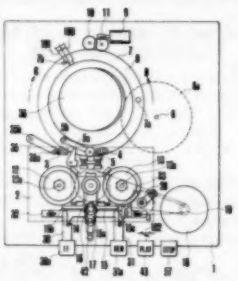
Masaya Maeda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1981, Ser. No. 312,326

Claims priority, application Japan, Oct. 17, 1980, 55-145282

Int. Cl.³ G11B *15/00*

U.S. Cl. 360—85 **31 Claims**



1. A reproducing apparatus for reproducing an information signal from a strip-like recording medium, comprising:

(a) a pair of rotation means for taking up the medium in different directions respectively;

(b) reproducing means for reproducing the information signal from the medium;

(c) loading means for loading said reproducing means with the medium, said loading means being movable between a loading and an unloading position;

(d) generating means for generating driving power;

(e) moving means for moving the medium between the pair of rotation means, said moving means being able to move the medium at a first speed and a second speed faster than said first speed;

(f) first transmitting means for selectively transmitting the driving power to each of the rotation means and being able to operate in a first mode for transmitting the driving power to the selected rotation means at a first efficiency with the object of moving the medium at a third speed faster than said second speed and in a second mode for transmitting the driving power to the selected rotation means at a second efficiency lower than said first efficiency;

(g) first control means for controlling said first transmitting means so that said first transmitting means operates in said second mode when the moving means moves the medium at said second speed;

(h) second transmitting means for transmitting the driving power to one of the rotation means whose route for transmitting the driving power is different from the route of said first transmitting means; and

(i) second control means for controlling said second transmitting means so that said first transmitting means is able to operate when the moving means moves the medium at said first speed.

4,481,552

DISC UNIT FOR INFORMATION RECORDING AND/OR READING SYSTEM

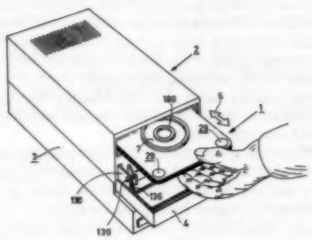
Marinus J. J. Dona; Adrianus J. J. Franken, both of Eindhoven, and Pieter van der Giessen, The Hague, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

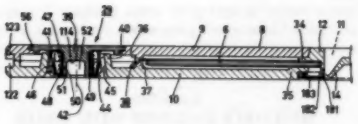
Continuation-in-part of Ser. No. 146,902, May 5, 1980, abandoned. This application Oct. 28, 1981, Ser. No. 315,792

Claims priority, application Netherlands, Jan. 22, 1980, 8000381

Int. Cl.³ G11B *23/02, 17/00*

U.S. Cl. 360—97 **11 Claims**





1. An interchangeable disc unit comprising:

A. a disc for holding recorded information, said disc including a central portion for engaging with a means for rotating the disc;

B. an enclosure for the disc including a first cover and a second cover, which engage with each other and are movable relative to each other and relative to the disc from a closed position to an operating position, at least one of the covers having a central opening for enabling passage of the means for rotating the disc about an axis of rotation, independently of the first and second covers, when the covers have been moved from the closed position to the operating position, said enclosure, when viewed in a direction perpendicular to the plane of the information disc, having a substantially polygonal shape; and

C. externally releasable connecting means for interconnecting the two covers, said connecting means comprising a plurality of separate connecting devices which are each disposed near a respective corner of the enclosure be-

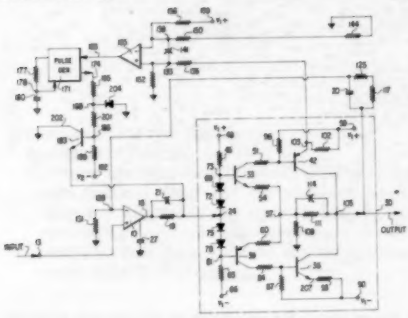
tween that corner and the circumference of the disc, each connecting device including a first connecting means attached to the first cover and a cooperating second connecting means attached to the second cover.

4,481,553

PROTECTION CIRCUIT

Louis L. Owen, West Chester; Mark P. Horujko, Fairfield, and William G. Bools, Blue Ash, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 5, 1982, Ser. No. 365,734
Int. Cl.³ H02H *7/20*
U.S. Cl. 361—93 **1 Claim**



1. An overcurrent protection circuit for a transistor (42) which is contained in the final stage of an amplifier (30) having an input (24), comprising:

(a) a resistor (135) connected between the emitter (103) of the transistor (42) and the noninverting input of a differential amplifier (165);

(b) a resistor (162) connected between the noninverting input and ground;

(c) a resistor (156) connected between the inverting input of the differential amplifier (165) and a first voltage source (V1+);

(d) a pair of resistors (150 and 144) connected in series between the inverting input of the differential amplifier (165) and ground, one of the resistors being variable;

(e) a pulse generator connected to the output of the differential amplifier (165);

(f) a resistor (177) and a capacitor (180) coupled to the pulse generator (171) for determining the duration of the pulse produced by the pulse generator;

(g) a pair of resistors (195 and 201) connected in series between an output (174) of the pulse generator (171) and the base of an NPN transistor (183) and defining a node (198) therebetween;

(h) a diode (204) connected between node (198) and ground and poled such that current flows from ground to node (198);

(i) a resistor (189) connected between the node (198) and a negative voltage source (V2−);

(j) a lead connected between the collector of the NPN transistor (183) and ground;

(k) a lead connected between the emitter of the transistor (183) and the input (24) of the amplifier (30),

(l) a resistor (102) connected between the emitter (103) of the transistor (42) and the first voltage source (V+),

wherein, in the absence of an overcurrent condition through emitter (103), negative voltage source (V2−) turns off NPN transistor (183), thus effectively disconnecting the input (24) from ground, but in the presence of an overcurrent condition, an excursion of the voltage of the emitter (103) in a direction away from the voltage of first voltage source (V1+) causes the differential amplifier (165) to produce an amplified voltage which is substantially proportional to the difference between the voltages at its inputs, and when the amplified voltage reaches a predetermined threshold, the pulse generator produces a positive pulse which turns on transistor (183), thereby effectively connecting input (24) to ground, thereby turning off the amplifier for the duration of the pulse and then allowing the amplifier (30) to turn on again at the end of the pulse, and

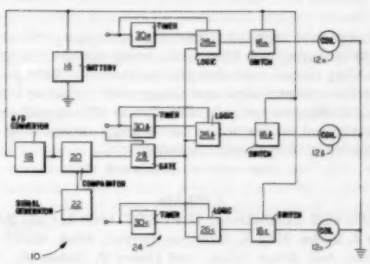
wherein the pulse generator (171) is activated both in response to an overcurrent through resistor (102) and in response to a short through resistor (102).

4,481,554

VOLTAGE ADAPTIVE SOLENOID CONTROL APPARATUS

Gwenne A. E. Henricks, East Peoria, Ill.; William Pickering, University Heights, and Wayne T. Wiblin, Saybrook, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Aug. 18, 1983, Ser. No. 524,271
Int. Cl.³ H01H *47/22*
U.S. Cl. 361—152 **14 Claims**



1. In an apparatus (10) for controllably operating at least one solenoid coil (12), said apparatus (10) including a battery (14) and at least one coil switch (16), the improvement comprising:

means (18) for receiving the battery voltage and producing a digital signal in response to said received voltage;

means (20) for receiving said digital signal, comparing said signal with a multi-bit digital reference signal, and producing a predetermined output signal in response to said compared signals; and,

logic means (24) for receiving said predetermined output signal and at least one coil command signal and delivering said output signal to at least one of said switches (16) in response to receiving both of said output and command signals.

4,481,555

ELECTROMAGNETIC CONTACT DEVICE

Masayuki Yoshida; Fumio Matsumoto, and Shigeharu Otsuka, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,913
Claims priority, application Japan, Sep. 24, 1981, 56-151258
Int. Cl.³ H01H *47/10*
U.S. Cl. 361—155 **7 Claims**

1. An electromagnetic contacting device, comprising in operative combination:

a base member with a fixed contact point mounted thereon;

a cross-bar provided on said base member in a freely slidable manner and on which a movable contact point is mounted to open and close a main circuit in cooperation with said fixed contact point;

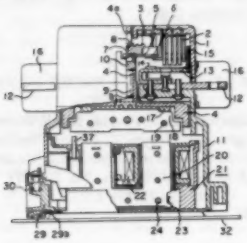
a fixed iron core on said base member;

a movable iron core mounted on said cross-bar for shifting said movable contact point;

an operating coil in combination with said fixed iron core to generate a predetermined energizing force;

a starting circuit to rectify a large capacity electric current from an AC power source, and to supply the rectified current to said operating coil;

a holding circuit including a converting means to supply said large capacity current from said power source to said operating coil through said converting means to convert the large capacity current to a small capacity when said iron cores are in contact; and



a change-over switch to change an energizing current for said operating coil from said starting circuit over to said holding circuit, said change-over switch including a hysteresis means to cause said change-over switch to activate said holding circuit only after closure of both said contact points, and to deactivate said holding circuit only after separation of both said contact points.

4,481,556

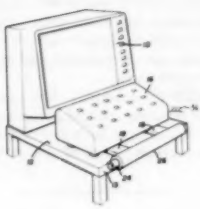
COMPUTER TERMINAL SUPPORT AND HAND REST

Joseph J. Berke, 3333 E. Jefferson, Detroit, Mich. 48207; Eric L. Gay, Ann Arbor, Mich., and Henry P. Doble, Jr., West Redding, Conn., assignors to Joseph J. Berke, Detroit, Mich.

Filed Apr. 4, 1980, Ser. No. 137,808

Int. Cl.[3] **H05F** *3/00*

U.S. Cl. 361—222 **15 Claims**



1. A computer terminal, keyboard or the like, and

a computer terminal support adapted to be placed on a desk top or the like, the desk top being of the type having a generally flat upper surface terminating in a forward edge, the computer terminal support comprising:

a first generally flat section to be interposed between the desk top and the computer terminal, said first generally flat section extending generally parallel to the desk top; and

a second section attached to said first section,

said second section adapted to be interposed between the computer terminal and a computer terminal operator in close proximity to the computer terminal;

said second section extending side-to-side an amount generally the same as the width of the computer terminal;

said second section including a rest of narrow depth, front to back, for supporting the hands of the computer terminal operator during periods of non-use of the computer terminal;

said support including conductive means for draining static charge from the computer terminal operator prior to any static charge on the operator being transferred to the computer terminal so that any such static charge by-passes the computer terminal.

4,481,557

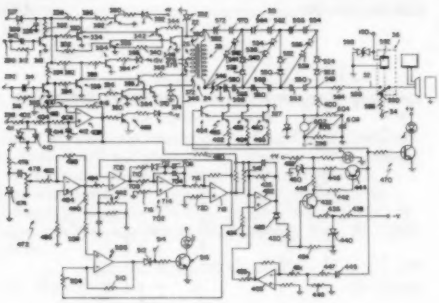
ELECTROSTATIC COATING SYSTEM

Frederick W. Woodruff, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Sep. 27, 1982, Ser. No. 423,822

Int. Cl.[3] **B05B** *5/02*

U.S. Cl. 361—235 **1 Claim**



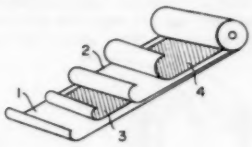
1. A power supply for generating an electrostatic potential for charging a device from which coating material is dispensed to charge the coating material electrostatically as it is dispensed, the power supply including an electrostatic potential generator having an input control terminal, a pair of output terminals across which the device for dispensing charged coating material is to be coupled, means for selectively coupling the output terminals to the electrostatic potential generator, the means for selectively coupling the output terminals to the electrostatic potential generator including an input control terminal, means for sensing the potential across the output terminals, means for sensing current flow between the output terminals, means for developing a first signal related to the rate of change in current between the output terminals, means for coupling the first signal developing means to the means for sensing current flow between the output terminals, means for coupling the first signal developing means to the input control terminal of the means for selectively coupling the output terminals to the electrostatic potential generator, the first signal controlling the means for selectively coupling the output terminals to the electrostatic potential generator, the means for coupling the first signal developing means to the current flow sensing means and the means for selectively coupling the output terminals to the electrostatic potential generator operating after an inhibit interval after energization of the power supply to control the means for selectively coupling the output terminals to the electrostatic potential generator based upon sensed current, a circuit for generating a second signal for controlling the electrostatic potential generator, means for coupling the second signal generating circuit to the means for sensing the potential across the output terminals, means for coupling the second signal generating circuit to the input control terminal of the electrostatic potential generator, means for generating a ramp signal, the means for coupling the second signal generating circuit to the control terminal of the electrostatic potential generator including means for combining the ramp signal and the second signal in such a manner that, during the inhibit interval, the control terminal of the electrostatic potential generator is controlled by the ramp signal generating means, and at the end of the inhibit interval, the control terminal of the electrostatic potential generator is controlled by the means for sensing the potential across the output terminals.

4,481,558

WOUND FOIL TYPE FILM CAPACITOR

Hiromi Endoh, Nagano; Katsutoshi Uraki, Kawasaki, and Akira Miyamoto, Suzaka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 428,287
Claims priority, application Japan, Oct. 6, 1981, 56-158996
Int. Cl.³ H01G *1/01, 4/08, 7/00*
U.S. Cl. 361—303 **8 Claims**



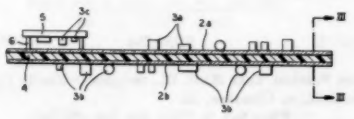
1. A wound foil type film capacitor comprising;
two sheets of dielectric films;
two metal electrode films alternately layered between the two dielectric films, and the alternated layers being wound at least one of said electrode films is formed by stretching a round wire material having a circular cross-section to form the round wire material into a specified width at the time of winding.

4,481,559

MOUNTING STRUCTURE FOR COMPONENTS OF ELECTRONIC SWITCHING DEVICE

Robert Buck, Neukirch, and Norbert Lichte, Schlier, both of Fed. Rep. of Germany, assignors to i f m electronic GmbH, Essen, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,440
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123372
Int. Cl.³ H05K *1/14*
U.S. Cl. 361—395 **12 Claims**



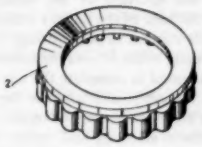
1. A mounting structure for components of an electronic switching device, comprising:
a housing;
a flat nonconductive elongate support in said housing,
a pair of dielectric layers of flexible film material covering opposite sides of said support;
a multiplicity of first circuit elements secured to an exposed surface of each of said layers, said circuit elements being electrically interconnected by conductor strips on said layers; and
an ancillary carrier of rigid material secured to and spacedly overlying a part of one of said layers free from said first circuit elements, at least one second circuit element being disposed on said ancillary carrier between the latter and said one of said layers.

4,481,560

SAFETY LAMP WITH NOCTILUCENT LENS HOLDER

Chang H. Ra, Bucheon-si, Rep. of Korea, assignor to Nambang Corporation, Seoul, Rep. of Korea

Filed Jul. 29, 1982, Ser. No. 402,892
Int. Cl.³ F21V *9/16*
U.S. Cl. 362—84 **1 Claim**



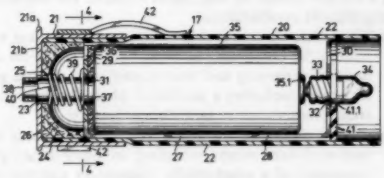
1. A light fixture comprising:
a housing;
a reflector operatively mounted within said housing;
a light source operatively positioned relative to said reflector for projecting light outwardly from said
a lens holder operatively attached to said housing for retaining said reflector and light source;
said lens holder being constructed of a luminous material for receiving light during normal operation and for continuing to radiate light after the light source is extinguished;
said luminous material being composed of 80% to 90% of Acrylonitrile Butadiene Styrene resin and 10% to 20% luminous paint powder wherein the luminous paint powder is selected from the group consisting of ZnS-Cu and CaS-Bi.

4,481,561

GUN BORE SIGHTING FLASHLIGHT ACTIVATED UPON BREECH CLOSURE

Charles T. Lanning, Watertown, S. Dak., assignor to Site-Lite, Inc., Jamestown, N. Dak.

Filed Feb. 1, 1983, Ser. No. 462,786
Int. Cl.³ F41G *1/34;* F21L *7/00*
U.S. Cl. 362—111 **6 Claims**



1. A gun bore sighting flashlight for insertion into the cartridge chamber of a gun barrel, said gun including a breech assembly, comprising
a cartridge case to fit snugly into the chamber and having an open front end and a closed rear end with a primer opening therethrough, said cartridge case being of the size and shape of an ammunition cartridge for the chamber,
flashlight means within the cartridge case for casting a beam of light axially forwardly from the front end of the case, said flashlight means including a bulb at the open front end of the case and a conductive holder mounting the bulb in stationary position, a battery in the case and behind the bulb, an insulator traversing the base of the battery and having a central aperture therein, and movable means consisting of two elements for completing a circuit connected with the bulb and battery for illumination of the bulb, one of said elements being a switch pin in the primer

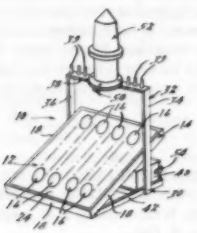
opening and guided by the walls of the primer opening for sliding movement therethrough, and the other of said elements being a spring normally biasing the switch pin to project outwardly of the rear of the case, the spring having one end anchored within the case in continuous circuit connected relationship and the other end anchored to the switch pin so that inward sliding movement of the switch pin through the aperture of the insulator into direct contact with the base of the battery completes the circuit in a manner for current to pass through the spring to the switch pin directly to the base of the battery, said movable means being adapted to complete the circuit upon closure of the breech assembly, and wherein the rear end of the switch pin has an axial opening for receiving the firing pin of the gun without affecting said circuit means.

4,481,562

SOLAR POWER STATION

Alan D. Hickson, Detroit, Mich., assignor to T & L Electronics, Inc., Dearborn Heights, Mich.

Filed Mar. 28, 1983, Ser. No. 479,825
Int. Cl.³ F21L 7/00; H01L 31/00
U.S. Cl. 362—183 **8 Claims**



1. In a self-contained signaling apparatus having an electrically-operable signal element and a storage battery for supplying electrical energy to said signal element, the improvement comprising in combination:

solar electric generator means connectable to said storage battery for converting ambient light to electrical energy and for recharging said battery, said solar electric generator means including a number of photoelectric cells electrically connected to said storage battery;

enclosure means for enclosing said solar generator means, said enclosure means including an outer panel portion composed of a substantially transparent material for allowing said ambient light to pass therethrough to said solar generator means; a bracket assembly for supporting said enclosure means in a relationship therewith such that said transparent upper portion faces in a generally upward and horizontally outward direction relative to said bracket assembly, said bracket assembly including mounting means adapted for mounting said signal apparatus thereon, said mounting means being positioned substantially above said solar generator means in order to substantially minimize the obstruction of said ambient light from striking said solar generator means and to maximize visibility of said signal apparatus, said bracket assembly further including a number of spike-like members protruding in a substantially upward direction therefrom in order to discourage birds or the like from perching on said bracket assembly; and

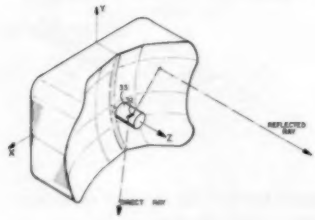
means adapted for enclosing and attaching said storage battery to said bracket assembly.

4,481,563

AUTOMOTIVE HEADLIGHT HAVING OPTICS IN THE REFLECTOR

Edward A. Snyder, Lindley, and Michael P. Teter, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 10, 1982, Ser. No. 376,511
Int. Cl.³ F21V 7/00
U.S. Cl. 362—296 **22 Claims**



1. A digital computer aided process for producing a smooth, unfaceted reflector for a lighting unit having a prescribed light dispersion pattern comprising:

(a) digitizing said prescribed light pattern as an input to a digital computer;

(b) digitizing the parameters of a plurality of shape functions specifying the surface of said reflector as an input to said digital computer;

(c) tracing the path of a plurality of light rays emanating from a digitally modeled light source, intersecting said reflector and projecting onto a surface spaced apart from said reflector;

(d) determining the light intensity across said surface;

(e) comparing said light intensity to said prescribed light pattern;

(f) changing said parameters of said shape functions to meet said prescribed light pattern;

(g) repeating steps (c)–(f) in an iterative procedure to determine the shape function which produces a light intensity best matching said prescribed light pattern;

(h) at each change of said parameters, smoothing the junctions between said shape function so that they have a well-defined normal and a minimum radius of curvature greater than about 0.050 inches; and

(i) fabricating reflectors having said shape function which produces a light intensity best matching said prescribed light pattern.

4,481,564

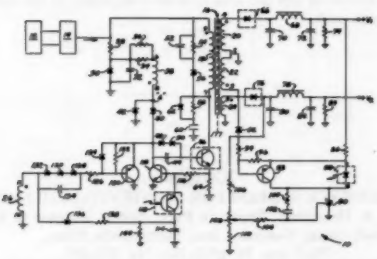
SWITCHED-MODE POWER SUPPLY

Suchen Balaban, Lake Bluff, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 9, 1982, Ser. No. 416,201
Int. Cl.³ H02M 3/335
U.S. Cl. 363—21 **9 Claims**

1. In a switched-mode power supply for converting an input voltage into a DC output voltage, said power supply including switching means responsive to an input current for operating in a self-oscillating mode for producing a DC power supply voltage, actuation means coupled to said switching means and responsive to said input voltage for providing an input current to said switching means for initiating the operation thereof in said self-oscillating mode, a transformer having a plurality of primary windings including a first primary winding in circuit with said switching means and a plurality of secondary windings inductively coupled to said primary winding and in each of which an output voltage is generated in response to said intermittently produced DC power supply voltage, a control circuit for controlling the operation of said switching means comprising:

regulating means coupled to said switching means and to a first secondary winding of said transformer and responsive to an output voltage for periodically rendering said switching means alternately in the conducting and cut-off states wherein said switching means is rendered in said cut-off state by the diversion of said input current therefrom by said regulating means with the duration of the conducting state of said switching means determined by the value of said output voltage, said regulating means including a photocoupler responsive to said output voltage for diverting said input current from said switching means when said output voltage exceeds a reference voltage level;



first circuit means coupled to said regulating means and to a second secondary winding of said transformer and responsive to the current induced therein by the DC power supply voltage provided by said switching means for rendering said regulating means inoperative when said switching means is in the cut-off state such that upon turn-on of said switching means no input current is initially diverted therefrom; and

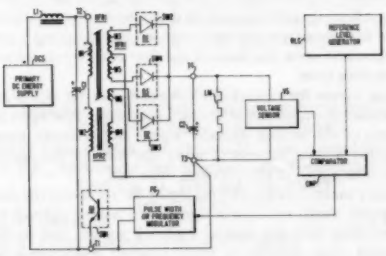
second circuit means coupled to said actuation means and to a second primary winding of said transformer and responsive to the absence of current therein following the cut-off of said switching means for diverting the input current of said actuation means from said switching means when said switching means is rendered in said cut-off state.

4,481,565

CORE RESET FOR SINGLE-ENDED DC-TO-DC CONVERTER

Robert M. Colton, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 8, 1982, Ser. No. 396,282
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—56 **3 Claims**



1. In a direct-current to direct-current converter of the type using:

first and second terminals for connection of a primary dc energy supply therebetween;

third and fourth terminals for connection of a load therebetween;

a first transformer with primary winding and a first and second secondary windings;

a second, flyback transformer with primary winding and a secondary winding;

first switch means for selectively completing during a first series of time intervals a series connection of the primary windings of said first and second transformers between said first and second terminals, said first series of time intervals being interspersed with a second series of time intervals;

second switch means for selectively completing during said first series of time intervals a first connection between said third and fourth terminals through the first secondary winding of said first transformer; and

third switch means for selectively completing, during said second series of time intervals, a second connection between said third and fourth terminals through the secondary winding of said second transformer;

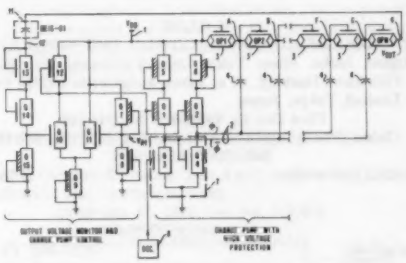
the improvement wherein said second secondary winding of said first transformer is included in said second connection between said third and fourth terminals for counteracting the undesirable tendency towards magnetic saturation in said first transformer.

4,481,566

ON CHIP CHARGE TRAP COMPENSATED HIGH VOLTAGE CONVERTER

Charles R. Hoffman, Raleigh, and Geoffrey B. Stephens, Cary, both of N.C., assignors to International Business Corporation, Armonk, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,682
Int. Cl.³ H02M *3/18*
U.S. Cl. 363—60 **3 Claims**



1. A charge trapping corrected, on chip, high voltage power supply apparatus comprising:

a charge pump circuit having drive inputs connected to a low voltage power supply and having outputs supplying the pumped high voltage;

a feedback circuit connected to the high voltage outputs of said charge pump and including a series connected DEIS means exhibiting charge trapping which reduces the voltage fed back in proportion to the trapping occurring therein; and

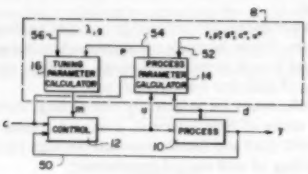
voltage control means connected in series to the charge pump drive inputs for decreasing the voltage applied thereto in proportion to the voltage from said DEIS means.

4,481,567

ADAPTIVE PROCESS CONTROL USING FUNCTION BLOCKS

Azmi Kaya, Akron, and Michael P. Lukas, Eastlake, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 1, 1982, Ser. No. 353,262
Int. Cl.³ G05B *13/02*
U.S. Cl. 364—157 **3 Claims**



1. An adaptive control for a process having a controller for generating a control output, the process having a set point, a process output and a plurality of disturbances comprising:

a process parameter calculator for receiving the disturbances, the control output and the set point, and generating a plurality of process parameters, each being a sum of selected functions of each of the disturbances, control output and set point; and

a tuning parameter calculator connected to said process parameter calculator for receiving said plurality of process parameters and for receiving at least one design function and at least one performance parameter, said tuning parameter calculator including means for generating at least one tuning parameter as a function of said process parameters, said at least one design function and said at least one performance parameter, said tuning parameter calculator connected to the controller for applying said at least one tuning parameter to the controller;

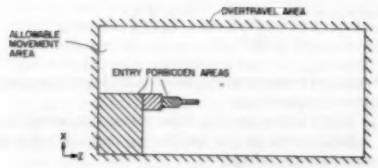
said process and tuning parameter calculators both comprising a plurality of function blocks connected to each other for manipulating values received according to said selected functions and at least one design function.

4,481,568

NUMERICAL CONTROL METHOD AND APPARATUS

Hajimu Inaba, Hino; Yukio Ono, Yokohama, and Mitsuo Hiraizumi, Hachioji, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,614
Claims priority, application Japan, Oct. 23, 1980, 55-148760
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—167 **9 Claims**



1. A numerical control method for controlling the movement of a movable member by setting entry forbidden areas which said movable member is forbidden to enter, said method comprising:

entering path data for a movement path of the movable member;

creating and storing in a memory, entry forbidden data relating to the boundaries of said entry forbidden areas, where said entry forbidden data can be noncorresponding to the path data, such that the entry forbidden data defines areas adjacent to the movement path as well as areas not adjacent to the movement path;

monitoring the current position of the movable member;

ascertaining on the basis of said entry forbidden data, whether the current position of said movable member resides within an entry forbidden area; and

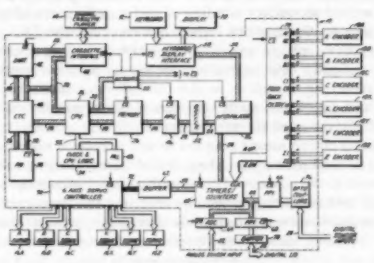
halting the movement of said movable member when the current position thereof has entered an entry forbidden area, so that if the movable member, which during normal operation should be moving along the movement path, enters the entry forbidden area, movement will be halted whether or not the area entered is adjacent to the movement path.

4,481,569

FEEDBACK SYSTEM FOR ROBOT CONTROLLER

Samir A. Hoodbhoy, Brooklyn Park, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Jun. 24, 1982, Ser. No. 391,515
Int. Cl.³ G05B *19/18*
U.S. Cl. 364—183 **31 Claims**



1. A feedback system for providing a first feedback signal representing incremental motion of a movable means in a first direction along an axis and a second feedback signal representing incremental motion in a second opposite direction along the axis in response to first and second encoder signals from an encoder means, the encoder signals having first and second states depending upon motion of the movable means sensed by the encoder means, the feedback system comprising:

first means for receiving the first encoder signal and producing a first signal having a state dependent upon the state of the first encoder signal and a second signal having a state dependent upon the state of the first encoder signal at a previous time;

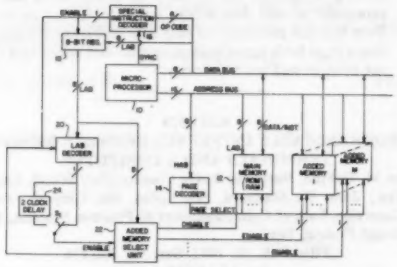
second means for receiving the second encoder signal and producing a third signal having a state dependent upon the state of the second encoder signal and a fourth signal having a state dependent upon the state of the second encoder signal at the previous time; and

memory means having address inputs for receiving the first, second, third, and fourth signals and having outputs for providing first and second feedback signals, and having stored code defining a predetermined relationship between the first, second, third and fourth signals and the first and second feedback signals, the memory means producing the first and second feedback signals as a function of the first, second, third and fourth signals and the stored code.

4,481,570
AUTOMATIC MULTI-BANKING OF MEMORY FOR MICROPROCESSORS

Gordon A. Wiker, Arcadia, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 7, 1981, Ser. No. 291,645
Int. Cl.³ G06F *13/00, 13/06*
U.S. Cl. 364—200 **12 Claims**



1. In a microprocessor system having a main memory for storing a program and data, said program including a set of indirect addressing instructions of a specified type, each having a detectable operations code accompanied by an address pointing to a memory location containing an effective address of a memory location on which the instruction is to operate, apparatus for expanding the memory address spaces of said system beyond its address word length capacity comprising

a plurality of added memories connected in parallel with said main memory, each associated with a different address pointing to a memory location from which an effective address is to be read from instructions of said set,

means for decoding the operations code of instructions, and

means responsive to said operations code decoding means, when said decoding means decodes an operations code for an instruction of said set of indirect addressing instructions of said specified type, for decoding the pointing address which accompanies an operations code of an instruction of said set, and means responsive to said address decoding means for disabling said main memory and enabling a selected one of said added memories to cause the effective address of the instruction to be operative in accessing an added memory associated with the pointing address of an instruction of said set, when said decoding means decodes an operations code for an instruction of said set of indirect addressing instructions of said specified type, and for not disabling said main memory, and not enabling any added memory, when said decoding means does not decode an operations code for an instruction of said set of indirect addressing instructions of said specified type.

4,481,571
DIGITAL DATA PROCESSING SYSTEM WITH ACCUMULATION INSTRUCTIONS

John F. Pilat, Raleigh, and Thomas M. Jones, Chapel Hill, both of N.C., assignors to Data General Corp., Westborough, Mass.

Filed Sep. 11, 1981, Ser. No. 301,997
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—200 **5 Claims**

1. In a digital computer system including

(A) main memory means for performing memory operations including storing and providing items of data including instructions in response to memory commands specifying said memory operations and addresses of said items in said main memory means and

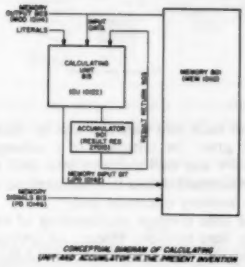
(B) processor means connected to said main memory means for receiving said items, processing said items, and providing said memory commands and said processed items in response to said instructions,

and wherein said instructions do not specify internal register means of said processor means as either destinations for said items received from said main memory means or sources of said items provided to said main memory means,

means for performing operations on certain said items comprising:

(1) result memory means connected to said processor means for receiving and storing a result item resulting from each one of said operations;

(2) operation execution means in said processor means for receiving said certain items, executing said one operation



CONCEPTUAL DIAGRAM OF CALCULATING UNIT AND ACCUMULATOR IN THE PRESENT INVENTION

on said certain items, and outputting said result item, said operation execution means having an input for selectively receiving said certain items from said items received in said processor means from said main memory means and said result item from said result memory means and an output for providing said result item to said main memory means and to said result memory means;

(3) first certain said instructions containing first certain said operation codes specifying said result item as one of said certain items; and

(4) control means connected to said operation execution means and responsive to said first certain operation codes for receiving said first certain operation codes and causing said operation execution means to select said result item as one of said certain items.

4,481,572
MULTICONFIGURAL COMPUTERS UTILIZING A TIME-SHARED BUS

Brandt P. Ochsner, Thousand Oaks, Calif., assignor to Teledyne Industries, Inc., Northridge, Calif.

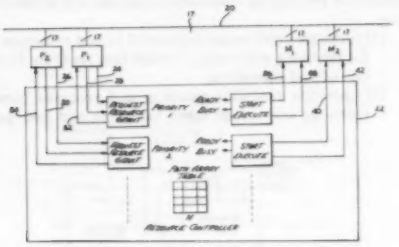
Filed Oct. 13, 1981, Ser. No. 310,458
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **31 Claims**

1. In a computer system, the improvement comprising

a time-shared bidirectional multiplexed bus, said bus having a first plurality of lines for carrying addresses, instructions and data in a time division multiplexed operation

a plurality of units coupled in parallel to said bus for communication therebetween over said bus lines, said plurality of units including at least one processor unit and at least one memory unit, each said processor unit having a relative priority in the system, each said processor unit further including request means for requesting access to said bus for communication thereover to another specific unit coupled to said bus, each said memory unit having a predetermined access time associated with memory operations dependent upon the time within which memory read and write cycles will be completed by said memory units, and

a resource controller, said resource controller being coupled to each said processor and each said memory unit, said resource controller being responsive to bus access requests from each said processor to grant bus access thereto for initiation of a memory operation with one said memory unit, said resource controller further having means for retaining said predetermined access times asso-



ciated with each said memory unit to withhold a subsequent bus grant for initiation of a subsequent memory operation for any said memory unit until the respective said predetermined access time has expired since initiation of a prior memory operation and

wherein said time division multiplexing of said bus occurs during the time between placing an address on said bus and placing data associated with said address on said bus.

4,481,573

SHARED VIRTUAL ADDRESS TRANSLATION UNIT FOR A MULTIPROCESSOR SYSTEM

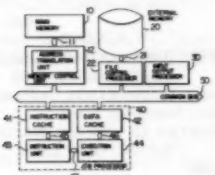
Yasushi Fukunaga, Hitachi; Tadaaki Bandoh, Ibaraki; Hidekazu Matsumoto, Hitachi; Ryosei Hiraoka, Hitachi; Jushi Ide, Mito; Takeshi Kato, Hitachi, and Tetsuya Kawakami, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan and Hitachi Engineering Co., Ltd., Ibaraki, Japan

Filed Nov. 13, 1981, Ser. No. 320,934

Claims priority, application Japan, Nov. 17, 1980, 55-160758; Oct. 2, 1981, 56-156193

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **9 Claims**



1. A virtual storage data processing system comprising:

(a) a main memory for storing data and instructions;

(b) an external memory for storing data and instructions to be stored in said main memory;

(c) a job processor for accessing said main memory with virtual addresses to access data and instructions stored therein;

(d) a file processor connected to external memory for accessing said main memory with virtual addresses to transfer data and instructions between said main memory and said external memory;

(e) a memory controller connected to said main memory and including an address translation unit which translates virtual addresses from said job processor and said file processor into physical addresses and means for controlling accesses to said main memory with the translated physical addresses;

(f) a common bus for connecting said job processor and file processor with said memory controller; and

(g) the address translation unit of said memory controller having means providing status flags indicating that said file processor is transferring a partial data block between said main memory and said external memory, and means responsive to said status flags being set for causing said address translation unit to allow an access from said file processor to said data block, while inhibiting an access from said job processor to said data block and for outputting a page fault signal indicating that said data block does not exist in said main memory.

4,481,574

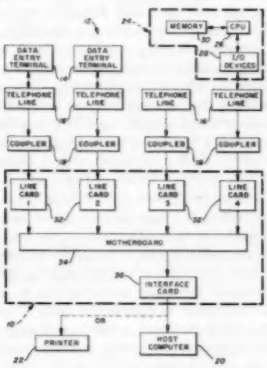
PROGRAMMABLE INTERFACE BETWEEN REMOTE TERMINALS AND A COMPUTER

John M. DeFino, Burleson; Rufus Coomer, Fort Worth, both of Tex.; John W. Stannard, Los Gatos, and Gary G. Voget, Cupertino, both of Calif., assignors to Pinetree Systems, Inc., Grand Prairie, Tex.

Filed Feb. 18, 1982, Ser. No. 350,131

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—200 **7 Claims**



1. A programmable data receiver for interfacing between remote terminals and a host data terminal, comprising:

means for receiving data transmitted over telephone lines to the data receiver from the remote terminals;

means for identifying call record data from a remote data entry terminal;

means of identifying command data from a remote service computer terminal;

electronic digital signal processing means for processing received data;

non-volatile memory means for storing program instructions for said electronic digital signal processing means;

volatile memory means for storing customer application program instructions for processing the received data by said electronic signal processing means;

random access memory means;

means for receiving and storing customer application program instructions in said random access memory means responsive to command data from the remote service computer terminal;

means for moving the customer application program instructions from said random access memory to said non-volatile memory area to revise the customer application program instructions;

control logic circuit means responsive to said electronic

digital signal processing means for controlling the transfer of data in and out of the data receiver; and

means for transferring received data from the data receiver to a host data terminal.

4,481,575

ARRANGEMENT IN A DATA PROCESSING SYSTEM TO REDUCE THE CYCLE TIME

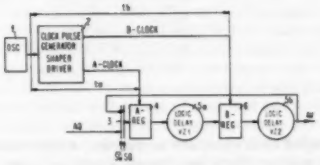
Dieter Bazlen, Stuttgart; Johann Hajdu, and Günter Knauft, both of Boeblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,663

Claims priority, application European Pat. Off., Mar. 23, 1981, 81102152.6

Int. Cl.³ G06F *1/04*

U.S. Cl. 364—200 **4 Claims**



1. Arrangement in a data processing system to reduce the cycle time, the cycle time being established such that data emitted from a data source, enabled by a clock pulse from an A-clock pulse source, can be safely stored in a receiver circuit, which is enabled by a clock pulse from a B-clock pulse source, wherein the data are propagated through a chain of data flow elements characterized in that the effects of propagation delay tolerance of all clock control and data flow elements are eliminated in determining the cycle time, the data source being controlled by the clock pulses of the A-clock pulse source, and the receiver circuit by the clock pulses of the B-clock pulse source, and the clock pulses of the two clock pulse sources having the same frequency and not overlapping with respect to time, said chain of data flow elements with a given propagation delay being divided into two partial chains with corresponding propagation delays in such a manner that the first partial chain is provided between said data source and said receiver circuit, and the second partial chain between said receiver circuit and said data source.

4,481,576

METHOD OF STORING DATA IN A MEMORY OF A DATA PROCESSING SYSTEM

John Bicknell, Rudgwick, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1982, Ser. No. 359,643

Claims priority, application United Kingdom, Mar. 25, 1981, 8109381

Int. Cl.³ G06F *13/00*

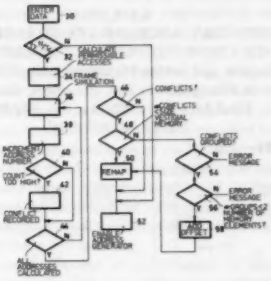
U.S. Cl. 364—200 **8 Claims**

1. A method of storing data in a memory of a data processing system, which memory comprises a plurality of memory blocks, characterized in that said method comprises the steps of:

(a) checking if storing according to a standard address pattern is applicable for a required storage operation without infringing an access restricting of the addressed memory block, and in the case where said standard address pattern is applicable, activating an address generator for generating addresses according to said standard address pattern;

(b) in the case where said standard address pattern is not applicable, remapping, according to a first predetermined distribution pattern, the addresses of those locations in the memory to which access is required;

(c) checking if storing according to said first predetermined distribution pattern is applicable for the required storage operation without infringing an access restriction of the addressed memory block, and in the case where said first predetermined distribution pattern is applicable, activating said address generator for generating addresses according to said first predetermined distribution pattern; and



(d) in the case where said first predetermined distribution pattern is not applicable, generating a first conflict signal.

4,481,577

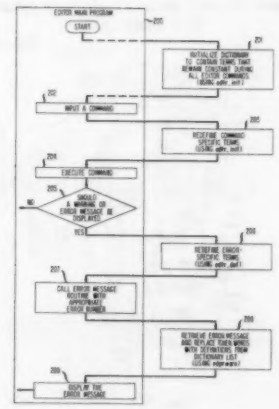
METHOD OF OPERATING A COMPUTER SYSTEM TO PROVIDE CUSTOMIZED RESPONSES

Henry M. Forson, New Monmouth, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 25, 1982, Ser. No. 361,821

Int. Cl.³ G06F *7/00, 3/00*

U.S. Cl. 364—200 **9 Claims**


START
INITIALIZE DICTIONARY
INPUT A COMMAND
EXECUTE COMMAND
SHOULD A WARNING OF ERROR MESSAGE BE SUPPLIED?
CALL ERROR MESSAGE ROUTINE WITH APPROPRIATE ERROR NUMBER
DISPLAY THE ERROR MESSAGE

1. A method of operating a computer system so as to permit customized messages in response to a command that is invoked in an operating program, the messages being stored in an indexed file, at least some of the messages having token words that must be defined in order to provide a complete meaning to the message, said method comprising the steps of storing a dictionary set of definitions for token words, developing a condition to indicate that a particular message is required in response to the invocation of a command, retrieving a message from said indexed file in response to said condition, locating each token word that is present in the retrieved message, retrieving a definition from said dictionary set for said each token word that is present in the retrieved message, and replacing

said each token word with its corresponding definition stored in said dictionary set.

4,481,578

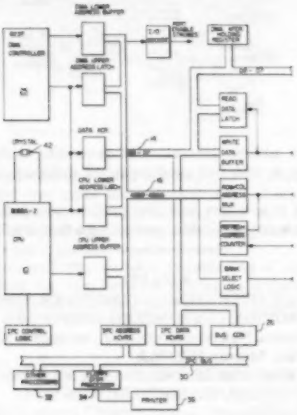
DIRECT MEMORY ACCESS DATA TRANSFER SYSTEM FOR USE WITH PLURAL PROCESSORS

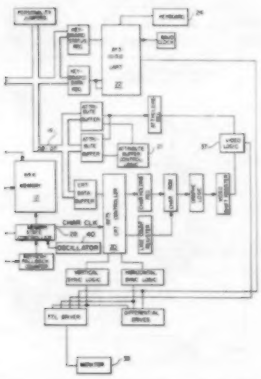
Jodie K. Hughes, and Sekine Hagiwara, both of San Jose, Calif., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 21, 1982, Ser. No. 380,962

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—200 **10 Claims**





1. Apparatus for transferring data comprising:

(a) first processing means for handling data;

(b) first data storage means operatively connected to said first processing means for storing data;

(c) second processing means;

(d) second data storage means operatively connected to said second processing means for storing data; and

(e) data transfer means operatively connected to said first processing means, to said first data storage means and to said second data storage means for transferring data from said first data storage means to said second data storage means directly and without intervention of said porocessing means.

4,481,579

DIGITAL DATA APPARATUS HAVING A PLURALITY OF SELECTIVELY ADDRESSABLE PERIPHERAL UNITS

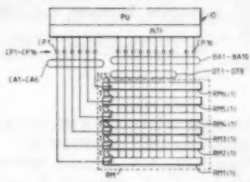
John R. Kinghorn, Sutton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,389

Claims priority, application United Kingdom, Jul. 31, 1981, 8123483

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **5 Claims**



1. Digital data apparatus comprising a data processing unit and a plurality of peripheral units, said data processing unit and said peripheral units being connected to a data bus for the transfer of digital data, said data processing unit being also connected to an address bus which comprises at least as many address lines as there are peripheral units, each peripheral unit being directly connected to said data processing unit by means of at least one of said address lines for selectively addressing said peripheral unit, each peripheral unit having a dedicated storage location for storing a multi-bit identification code which identifies uniquely that peripheral unit, wherein said data processing unit further comprises:

first means for applying to the address bus a particular address code corresponding to at least part of said multi-bit identification code for each peripheral unit to address said peripheral unit;

second means for generating select signals and applying them to the peripheral units via said address bus, each peripheral unit being directly selected by its select signal, which select signal is a bit of one value in said part of said multi-bit identification code; and

third means for enabling said transfer of digital data upon establishing the presence of said peripheral unit selected by said select signal.

4,481,580

DISTRIBUTED DATA TRANSFER CONTROL FOR PARALLEL PROCESSOR ARCHITECTURES

Richard J. Martin, Rosemount; David W. Bondurant, Eden Prairie, and Leslie W. Nelson, Excelsior, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 321,856, Nov. 16, 1981, , which is a continuation of Ser. No. 95,908, Nov. 19, 1979,. This application Jan. 27, 1983, Ser. No. 461,334

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **4 Claims**

1. In a single instruction stream/multiple data stream processor having a control processor for exercising control of said single instruction stream/multiple data stream processor in accordance with said single instruction stream, having a plurality of arithmetic units for performing arithmetic operations upon a plurality of data streams, and having a corresponding like plurality of local memories for buffering said plurality of data streams to and from said plurality of arithmetic units, an apparatus for transferring said plurality of data streams to said like plurality of local memories neither under centralized control arising from any centralized resource controller, nor under distributed control arising from said plurality of arithmetic

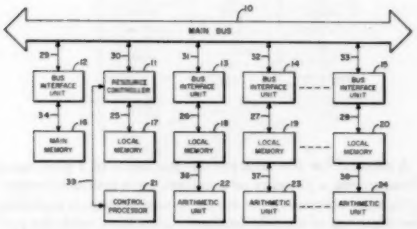
units, but rather under distributed control autonomous of, and non-conflicting with, the function of said plurality of arithmetic units, said apparatus for the distributed control of data transfers within said single instruction stream/multiple data stream processor comprising:

a main bus means for according the transfer of data thereon;

a plurality of arithmetic unit means each for processing data each connected to, and reading and writing data contained in, an associated one of a plurality of local memory means;

a plurality of said local memory means each for storing data of use, at a time, to an associated one of said plurality of arithmetic unit means, each responsively coupled for reading and writing of said data to said associated one of said plurality of arithmetic unit means, and each responsively coupled also for reading and writing of said data to an associated one of a plurality of bus interface units means; and

a plurality of bus interface unit means each coupled to said main bus for transferring data thereon, and also coupled to an associated one of said plurality of local memory means for the reading and writing of data, and for each controlling and effectuating the transferring, through said each one of said pluralty of bus interface unit means and via said main bus means and through another one of said plurality of bus interference unit means, of data read and written of the one of said plurality of local memory means associated with said each one of said plurality of bus interface unit means, and of data written and read of the another one of said plurality of local memory means associated with said



another one of said plurality of bus interface unit means WHEREIN said controlling and effectuating transferring, via said main bus means and through said each open and said another one of said plurality of bus interface unit means, is autonomously controlled in said each one of said plurality of bus interface unit means which commands said another one of said plurality of bus interface unit means to participate in said controlling and effectuating transferring wherein autonomously controlled does not mean devoid of any outside initiation but does mean that the conduct of said controlling and effectuating transferring without the involvement of any agency outside said each one of said plurality of bus interface unit means;

a main memory means for storing data of use, at times, to plural one of said plurality of arithmetic unit means; and

a further one bus interface unit means; identical to each of said plurality of bus interface unit means, associated with said main memory means and responsively coupled to said main bus means for transferring data thereon, and responsively coupled to said associated main memory means for the reading and writing of data stored therein said main memory means IN ORDER THAT said further one bus interface unit means will transfer, through said further one bus interface unit means and via said main bus means and through another one of said plurality of bus interface unit means, data between said memory means and one of said plurality of local memory means;

wherein a first difference between said main memory means and each of said plurality of local memory means is that said memory means is storing data of use, at times, to plural ones of said plurality of arithmetic unit means whereas each said local memory means is storing data of use, at at a time, to one of said plurality of arithmetic unit means;

wherein a second difference between said main memory means and each of said plurality of local memory mean is that said memory means is not responsively coupled to any one of said plurality of arithmetic unit means;

wherein said transfer of said data, of use at times to plural ones of said plurality of arithmetic unit means, between said main memory means and said ones of said plurality of local memory means, which said ones of said plurality of local memory means are responsively coupled for reading and writing to associated ones of said plurality of arithmetic unit means, is thusly a way that said data at times of use to plural said ones of said plurality of arithmetic unit means should be emplaced in locations, mainly said ones of said plurality of local memory means, wherein it may be read and written for said use,

wherein that said each one of said plurality of bus interface unit means is controlling and effectuating said transferring autonomously thusly requires that said transferring is without the involvement or control of any of said plurality of arithmetic unit means, or of said control processor, or of any other agency without said bus interface unit means whatsoever;

wherein because said controlling and effectuating said transferring of data resides in each of said plurality of bus interface unit means, then data transfer control within said apparatus may be said to be distributed.

4,481,581

SEQUENCE CONTROL CIRCUIT FOR A COMPUTER

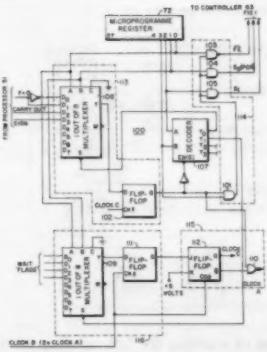
Courtenay P. Johnson, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 148,527, May 9, 1980, abandoned. This application Feb. 28, 1983, Ser. No. 470,249

Claims priority, application Canada, Mar. 31, 1980, 348886

Int. Cl.³ G06F *9/00*

U.S. Cl. 364—200 **13 Claims**



1. A logic circuit for controlling the sequencing of events in the operation of a digital computer by modifying the operation of a microprogramme sequence controller (**63**) and microprocessor (**51**), wherein said computer is under the control of binary microinstructions, said logic circuit characterized by:

a skip logic means (**113**), responsive to said microinstructions, for producing an output having either a first logic state indicative of a skip command or a second logic state indicative of a do not skip command;

a data gating means (**114**) for selectively transmitting to said sequence controller either first logic signals representative of corresponding logic bits in said microinstruction, or

predetermined second logic signals, indicative of a skip command;

said data gating means (114) being responsive both to the output of said skip logic means and to one of the bits in said microinstruction such that the first logic state of either one can provide an override signal whereby said data gating means transmits said second logic signals, otherwise said first logic signals are transmitted;

a wait logic means (116), responsive to said microinstructions, for producing an output having either a first logic state indicative of a wait command or a second logic state indicative of a do not wait command;

a clock means (115) both for producing a first clock signal (C) and a second clock signal (A) wherein said first and second clock signals have the same frequency;

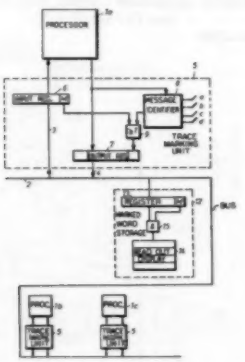
first means (110) for selectively inhibiting said second clock signal from appearing at the output of said clock means in response to the output of said skip logic means, whereby a skip condition is achieved due to the lack of clocking pulses to said processor (51); and

second means (112) for selectively inhibiting both said first clock signal and said second clock signal from appearing at the output of said clock means, in response to the output of said wait logic means, whereby a wait condition is achieved due to the lack of clocking pulses to said digital computer.

4,481,582
METHOD AND APPARATUS FOR ENABLING THE TRACING OF ERRORS OCCURING IN A SERIES OF TRANSFERS OF BINARY MESSAGE WORDS

Carl P. T. Edsbäcker, Sollentuna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 243,255, Mar. 12, 1981, abandoned. This application Oct. 27, 1983, Ser. No. 545,819
Claims priority, application Sweden, Mar. 24, 1980, 8002239
Int. Cl.³ G06F *11/10*
U.S. Cl. 364—200 **5 Claims**



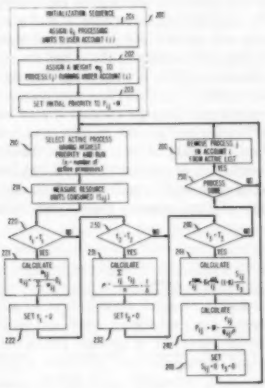
1. A method of enabling the following up of the development of an error in a computation sequence during an operation in progress, in which each computation gives a partial result, and the partial results taken together give a final result, and in which there is included a series of transfers of binary information words between a plurality of processing units which from a received information word a new information word is formed for transfer to a subsequent processing unit, said method comprising adding a marking label to an information word which initiates a computation sequence to be investigated, in each processing unit to which said labelled word is subsequently supplied, removing the label and storing the same and then adding the label to the resulting information word formed in the associated processing unit,

sensing each information word transferred between the processing units and copying the labelled information words transferred between the processing units into a memory, and displaying said information words which have been copied in said memory whereby to enable determining whether the words in the sequence of labelled information are correct.

4,481,583
METHOD FOR DISTRIBUTING RESOURCES IN A TIME-SHARED SYSTEM

Mark W. Mueller, Morganville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 30, 1981, Ser. No. 316,878
Int. Cl.³ G06F *9/46*
U.S. Cl. 364—300 **7 Claims**



1. A method for time sharing the resources of a processing machine among a plurality of accounts, each account containing processes competing for access to said resources including the periodic use of specific hardware associated with the processing machine, comprising the machine performed steps of:

assigning a separate processing rate entitlement to each account in response to performance requirements selected by each separate user, said processing rate entitlement being a measure of entitlement to access the resources of said processing machine;

allocating a share of the processing rate entitlement to the various processes within each account;

measuring the time periods during which each specific hardware is used by each process;

multiplying said time periods during which specific hardware is used with weight factors associated with each specific hardware to determine the resources consumed by each process;

calculating a processing rate for each process by dividing the resources consumed by a predetermined time interval;

calculating a priority for each process by dividing the allocated processing rate entitlement by the processing rate; and

executing the process having the highest priority.

4,481,584
HIGHWAY INFORMATION SYSTEM

Bobby H. Holland, 501 E. Angela Cir., Goodlettsville, Tenn. 37072

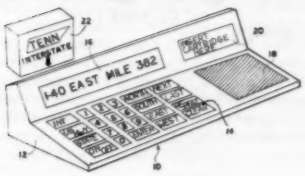
Filed Jul. 30, 1981, Ser. No. 288,314
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—424 **6 Claims**

1. An operator controlled highway information system for storing data and information related to the types of services

available at selected locations along a roadway, and for providing portions of said data and information related to specific ones of said locations in a recognizable human language as selected by said operator, and in response to distance indicator input data provided by said operator, comprising:

a selected mass storage means for permanently storing data in digital form relating to services available along a selected roadway, elements of said data being contained in a multiplicity of data groups, each of said data groups indexed according to distance indicators along said roadway, and each of said data groups being accessible according to said distance indicators;

input data entry keyboard for providing selectable data as input digital signals by said operator, said input digital signals including selected ones of roadway designation signals initiated by roadway designation keys for selecting a designated roadway, direction of travel signals initiated by directional keys for selecting which direction the permanently stored data is to be scanned, distance indication signals initiated by numerical keys for selecting a designated roadway location, and special control signals initiated by control keys for causing said system to repeat the previous system response or for causing said system to sequentially scan the permanently stored data in a designated direction;



a random access digital storage means for repeatedly receiving and temporarily storing selected and varied data;

a read only memory for permanently storing in digital form controlling data, said controlling data including an instructional program for controlling said system, and for providing interaction between said operator and said system to solicit input information from said operator, such interaction from said operator to said system by means of said input data keyboard, and from said system to said operator by means of a speech synthesizing means as determined by a processing means;

speech synthesizing means for receiving and converting digital data, including selected portions of said instructional program stored in said read only memory, and selected ones of said multiplicity of data groups, into output signals representative of said received digital data for providing audible or vocal sound representations of such data in a recognizable language; and

processing means for receiving and evaluating said input digital signals, controlling the transfer of said varied data to and from said random access storage means, and the transfer of said selected ones of said controlling data and said multiplicity of data groups to said speech synthesizing means and controlling said speech synthesizing means, said processing means operating in response to said input digital signals and said instructional program.

4,481,585

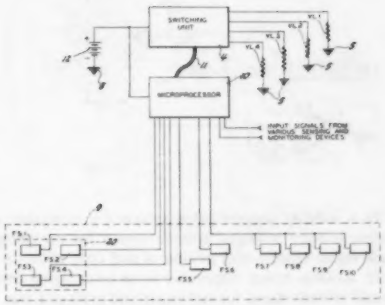
SYSTEM FOR SELECTIVELY CONTROLLING MOTOR VEHICLE ELECTRICAL LOADS

Gerald O. Huntzinger; Raymond O. Butler, Jr.; Lewis R. Hetzler; John Delaplane, and Anthony L. Marks, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 3, 1981, Ser. No. 289,464

Int. Cl.³ B60Q *1/00*

U.S. Cl. 364—424 **6 Claims**



5. A system for selectively controlling the several electrical loads of a motor vehicle comprising:

a switching unit including a plurality of electrical load switches of the type operable to at least two operating conditions by the actuation of an operating member, each of said load switches being connected in a corresponding vehicle load circuit;

a common actuator that is operable to actuate said operating members and that is selectively locatable in each of a plurality of switch locations in each of which it is in register with a said operating member;

first memory means for storing an electrical signal indicative of the acutal said operating condition of each said load switch;

function select means for producing an output function select electrical signal that indicates a said load switch is selected for operation;

second memory means;

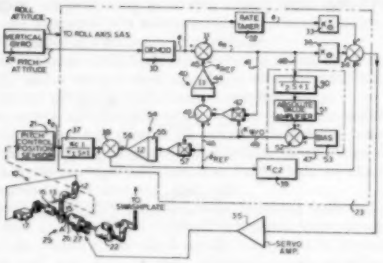
means upon the occurrence of a said function select signal for sensing the electrical signal indicative of the actual said operating condition of the selected said load switch and for placing in said second memory means a different electrical signal indicative of the other said operating condition of said selected load switch; and

means responsive to this discrepancy of electrical signal indications for determining the said switch location in which said common actuator must be located to actuate the said operating member of the selected said load switch to effect the operation thereof to the other said operating condition, for determining the actual said switch location in which said common actuator is located, for locating said common actuator in said determined switch location if different than said actual switch location, for effecting the operation of said common actuator when so located and for placing in said first memory means the electrical signal indicative of the operating condition of the selected said load switch subsequent to operation thereof.

4,481,586
ADAPTIVE WASHOUT CIRCUIT FOR USE IN A STABILITY AUGMENTATION SYSTEM

Edmund R. Skutecki, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 9, 1982, Ser. No. 356,549
Int. Cl.³ G06F *15/50*; G06G *7/78*
U.S. Cl. 364—434 **12 Claims**



1. In a stability augmentation system for navigable craft including a body mounted attitude sensor for providing an attitude signal representing motion of said craft about an axis thereof, actuator means responsive to an error signal derived from said attitude signal for stabilizing said craft said axis, said actuator means having a limited displacement capacity from a reference position and tending to reach the limit of said displacement capacity in response to large amplitude error signals, and maneuver control means for maneuvering said craft about said axis, an apparatus for preventing said actuator means for reaching said limit comprising:

error sensing means responsive to said attitude signal and to said maneuver control means for providing said error signal for driving said actuator means,

first washout means coupled to said actuator means for providing a first washout signal of opposite polarity to said error signal and of variable magnitude and time constant to thereby reposition said actuator means towards said reference position, and

control means providing a control signal for controlling the magnitude and time constant of said first washout signal in accordance with the displacement of said actuator means, said control signal causing said magnitude to increase and said time constant to decrease as said displacement approaches said limit.

4,481,587
APPARATUS FOR PROVIDING INTERCHANGEABLE KEYBOARD FUNCTIONS

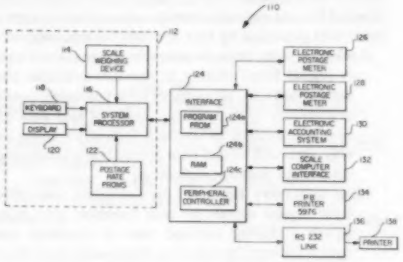
Edward P. Daniels, Jr., Bridgeport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 24, 1981, Ser. No. 334,116
Int. Cl.³ G06F *3/02*; G01G *19/40*
U.S. Cl. 364—466 **18 Claims**

1. An electronic weighing scale system or the like capable of performing a plurality of different functions comprising:

a keyboard for providing access to at least a subset of the functions said system can perform, said keyboard containing a plurality of keyswitches each arranged to provide a separate identifying output code when actuated;

interchangeable means responsive to said output codes for establishing the particular system function to be controlled by each different keyswitch, said interchangeable means having an input coupled to receive said keyswitch output codes and an output on which said means can present a plurality of function identification codes, each one representative of an established keyswitch function; and

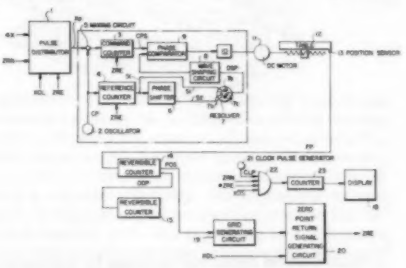


system processor means coupled to said output for executing said system functions as directed by said function identification codes in response to keyswitch actuations.

4,481,588
METHOD AND APPARATUS FOR ADJUSTING INSTALLATION POSITION OF SWITCH MEMBERS IN NUMERICAL CONTROL SYSTEM

Hidetsugu Komiya, Hino, Japan, assignor to Fanuc Ltd., Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,469
Claims priority, application Japan, Oct. 30, 1980, 55-152697
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 **9 Claims**



1. A method of adjusting the positions of switch members installed on a machine tool in a numerical control system having a grid signal generating circuit for generating a grid signal pulse whenever a movable member on the machine tool is transported by a predetermined increment of movement, wherein a zero-point return control operation is performed by transporting the movable member toward a zero point when the system is in a zero-point return mode, reducing the speed at which the movable member approaches the zero point when a dog which is installed on the movable member is brought into pressing contact with a deceleration limit switch that responds by immediately producing a deceleration signal, and stopping the movable member in response to the first grid signal pulse generated after the pressing contact between said dog and limit switch ends, which method comprises the steps of:

reading the current position of the movable member when said deceleration limit switch and said dog move out of pressing contact again;

displaying said current position; and

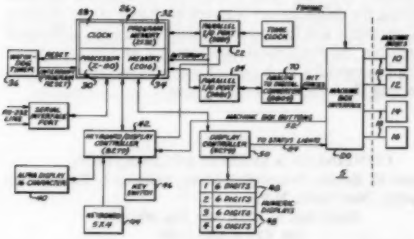
adjusting the position at which at least one of said deceleration limit switch and said dog is installed until determining, on the basis of the displayed current position, when said deceleration limit switch and said dog are installed on the machine tool at predetermined relative positions.

4,481,589

MATERIAL FORMING MACHINE CONTROLLER

Michael J. McGowan, Lombard; William H. Slavik, Palos Hills, and Carson D. Cash, III, Brookfield, all of Ill., assignors to Nuvatec, Inc., Lombard, Ill.

Filed Jan. 8, 1982, Ser. No. 337,901
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 **37 Claims**



14. A control apparatus for a material forming machine of the type which forms a plurality of workpieces through a sequence of respective forming operations, said control apparatus comprising:

means for generating a sequence of measured signals, each an analog of a measured parameter of a respective one of the forming operations;

first means, responsive to the measured signals, for signalling an out-of-tolerance condition by interrupting operation of the metal forming machine when the average value of the sequence of measured signals differs from a target value by more than a first amount over a first time period; and

second means, responsive to the measured signals, for signalling an out-of-tolerance condition by interrupting operation of the metal forming machine when the average value of the sequence of measured signals differs from the target value by more than a second amount over a second time period;

said first amount being less than the second amount and said first time period being longer than said second time period.

4,481,590

VENDING MACHINE CONTROL CIRCUIT

David M. Otten, Newton, Mass., assignor to PepsiCo Incorporated, Purchase, N.Y.

Division of Ser. No. 159,625, Jun. 16, 1980, Pat. No. 4,372,464. This application Sep. 30, 1982, Ser. No. 431,613
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—479 **1 Claim**

1. A vending machine including a control circuit, comprising:

(a) a plurality of switch means for enabling a customer to indicate his choice of a product to be vended;

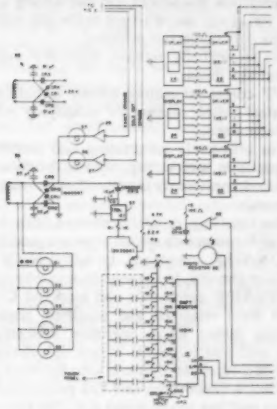
(b) logic means, coupled to said plurality of switch means and being responsive thereto, for controlling the vending of products;

(c) said logic means including a memory means for storing therein totals representative of the total number of vends of each type of product and totals representative of the cash received by the vending machine;

(d) said logic means also including a processor for controlling the operation of the vending machine;

(e) a power supply for the vending machine including an AC power supply, and means for converting the AC power to a DC power supply for said logic means, said DC power supply further including a battery power supply for said memory means to enable the storage therein of said totals during an interruption in the power supply for the logic means;

(f) means, coupled to said processor, for detecting an interruption in the power supply for said logic means, said detecting means including a capacitor coupled across the AC power supply which is almost discharged below a threshold level on each half cycle of the AC power supply, and a threshold detector for detecting a discharge of said capacitor below said threshold level; and



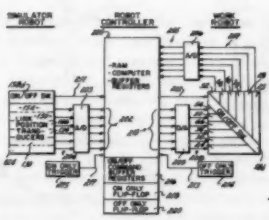
(g) said processor being responsive to said detecting means to interrupt its processing of signals to prevent an erroneous entry of one of said totals into said memory means.

4,481,591

METHOD AND APPARATUS FOR MODIFYING A PRERECORDED SEQUENCE OF ON/OFF COMMANDS FOR CONTROLLING A BISTABLE DEVICE OPERATING IN CONJUNCTION WITH A MOVING ROBOT UNDER PROGRAM CONTROL

Rolf T. Spongh, Waterloo, Belgium, assignor to Nordson Corporation, Amherst, Ohio

Filed Mar. 3, 1982, Ser. No. 354,313
Int. Cl.³ G06F *15/46*; G05B *19/42*
U.S. Cl. 364—513 **8 Claims**



1. A controller for concurrently driving an articulated robot link under closed loop servo control and operating a bistable device operating in conjunction with the robot link in response to a stored sequence of recorded link position commands and ON/OFF commands, respectively, the robot link having associated therewith a signal-responsive link actuator and a link position feedback transducer which provides a feedback signal correlated to link position, said controller having real time ON/OFF command editing capability, comprising:

means to store a sequence of recorded robot link position commands and ON/OFF commands,

means to sequentially retrieve robot link position commands from said storage means,

means responsive to a retrieved link position command and the link position feedback signal input from the link position feedback transducer for calculating a link position error signal and outputting it to the link actuator to drive the link to a command position,

means to sequentially retrieve ON/OFF commands from said storage means,

ON/OFF command editing means, including a manually-activated switch means, for modifying retrieved ON/-OFF commands,

means for effectively substituting said modified ON/OFF commands in said storage means for their respectively associated, previously retrieved, unmodified ON/OFF commands,

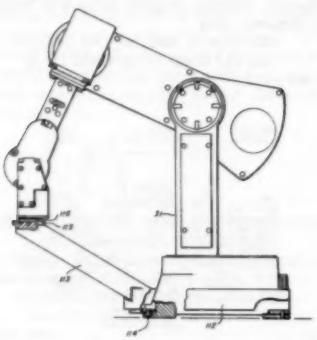
means for inputting, on an interleaved basis, both retrieved ON/OFF commands which were not modified and modified ON/OFF commands, to said ON/OFF device for execution thereby, in the sequence in which said unmodified ON/OFF commands and modified ON/OFF commands were retrieved and modified, respectively, said inputting means being operative substantially concurrently with said retrieving means, calculating means, and modifying means to facilitate simultaneously driving said robot link actuator with said link position error signals to position said link to command positions and actuating said ON/OFF device with said sequence of interleaved modified and unmodified ON/OFF commands, whereby said manually-activated switch means is activated to effectively manually modify ON/OFF commands of a recorded sequence on a real time basis while said controller is processing said recorded sequence of position and ON/-OFF commands for execution by said robot.

4,481,592

CALIBRATION SYSTEM FOR A PROGRAMMABLE MANIPULATOR

Henry W. Jacobs, and Stephen E. Althaus, both of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 5, 1982, Ser. No. 355,273
Int. Cl.³ G05B *19/42*
U.S. Cl. 364—513 **10 Claims**



1. A calibration system for a programmable manipulator, the manipulator having a base, a plurality of segments movable with respect to each other on centers of rotation, and an end effector, comprising:

(a) fixture means, attached to the base of the manipulator, having an end point to which the end effector attaches, exactly positioned and oriented with respect to the base, thereby establishing a known position and orientation of the end effector, the position of the end point representing an idealized position;

(b) a hand-held application module for directing the operation of the programmable manipulator, including calibration mode means for initiating calibration of the programmable manipulator;

(c) means for determining the theoretical displacement between each pair of the plurality of segments based on the distances between the centers of rotation of successive segments and the position and orientation of the end effector; and

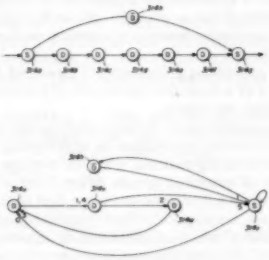
(d) means, activated when calibration is initiated, for measuring the displacement between each pair of the plurality of segments and for measuring and storing the difference between the theoretical displacement and the measured displacement for each pair of segments as offsets for correcting the measured displacement.

4,481,593

CONTINUOUS SPEECH RECOGNITION

Lawrence G. Bahler, Somerville, Mass., assignor to Exxon Corporation, New York, N.Y.

Filed Oct. 5, 1981, Ser. No. 309,209
Int. Cl.³ G10L *1/00*
U.S. Cl. 364—513.5 **18 Claims**



1. In a speech analysis apparatus for recognizing at least one keyword in an audio signal, a method for recognizing silence in the incoming audio signal comprising the steps of:

generating at least first and second target templates, each template representing, as a sequence of frequency spectrum representing parameters, an alternate description of silence in said incoming audio signal,

comparing said incoming audio signal with each of said first and second target templates,

generating a first and a second numerical measure representing the result of said comparisons respectively, and

deciding, based at least upon said numerical measures, whether silence has been detected.

4,481,594

METHOD AND APPARATUS FOR FILLING POLYGONS DISPLAYED BY A RASTER GRAPHIC SYSTEM

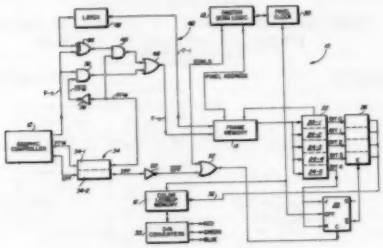
Kevin P. Staggs, Glendale; Charles J. Clarke, Jr., and James C. Huntington, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 18, 1982, Ser. No. 340,143
Int. Cl.³ G06F *3/14*; G09F *9/30*
U.S. Cl. 364—521 **8 Claims**

1. Apparatus for filling polygons displayed by a color CRT monitor of a computer generated raster graphic system, said system having a frame memory adapted to store color addresses and fast-fill toggle bits at memory locations whose addresses correspond to those of the pixels of the CRT of the monitor, raster scan logic for reading from the frame memory and, for producing in synchronism with the raster scan of the CRT, the color address and fast-fill toggle bit for each pixel, a color look-up memory adapted to store color control signals in memory locations, the addresses of which correspond to color

addresses stored in the frame memory; a graphic controller having the capability of writing data into addressed locations of the frame memory, of reading data from said locations and of determining the initial and terminal pixels of a fill element of a horizontal scan line of a polygon, and of producing control signals for controlling the mode of operation of said system, said system having a fast polygon write mode and a fast polygon display mode; said apparatus comprising:

means for reading, when the system is in fast polygon write mode, the fast-fill toggle bits from memory locations in the frame memory of boundary pixels defining the initial and terminal pixels of each fill element of each horizontal scan line, for setting the fast-fill toggle bits of boundary pixels of each fill element if and only if the fast-fill toggle bit read from the memory location for each such boundary



pixel is not set, and, if set, for resetting it and for writing the fast-fill toggle bits of boundary pixels of each fill element, and

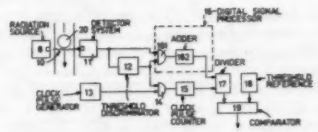
means for applying, when the system is in the fast polygon display mode, the color address stored at the initial boundary pixel of each fill element of each horizontal scan line to the color look-up memory in synchronization with the scan thereof until the terminal pixel of the fill element is read from the frame memory, thereafter for applying the color address of each pixel of the horizontal scan line to the color look-up memory in synchronization with the raster scan until another initial boundary pixel of another fill element of the horizontal scan line is is read from memory, or until the end of the horizontal scan line is reached, as long as the system is in its fast polygon display mode.

4,481,595

METHOD AND APPARATUS FOR DETERMINING THE FILL LEVEL OF CONTAINERS

Hans Schiessl, Markgrafenstrasse 8, 7530 Pforzheim, and Hermann Leistner, Im Lämmle 2, 7534 Birkenfeld 2, both of Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,537
Int. Cl.³ B07C 5/342
U.S. Cl. 364—562 **6 Claims**



1. A method of determining if containers are filled with a material to a selected level comprising the steps of:

transporting the containers across the path of a penetrating radiation beam that is projected from a radiation source to detector means which produces output pulse signals at a certain rate when no part of a container is in the beam and at lower rates when the beam is attenuated by the container and a material therein passing through the beam,

detecting the time (t_1) when the output pulse signal rate drops from a rate (N_0) corresponding to no part of a container being in the beam to a threshold rate corresponding to the leading wall of a moving container entering and attenuating the beam and to the start of a fill-height measuring interval (M),

initiating summing of said output pulse signals at the start of said interval and simultaneously initiating summing of clock pulses signals,

detecting the time (t_2) when said output pulse signal rate increases again to the threshold rate corresponding to the trailing wall of said moving container entering and attenuating the beam and to the end of said measuring interval,

terminating said summing of output pulse and clock pulse signals at said end of the measuring interval and then dividing one of the sums by the other to yield a test signal substantially representative of the average output pulse rate over the measuring interval, and

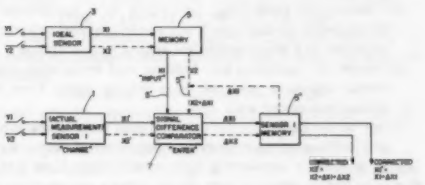
comparing the test signal with a reference signal to produce a difference signal whose magnitude is indicative of whether or not the container is filled high enough for its contents to attenuate the beam.

4,481,596

METHOD OF AND APPARATUS FOR AUTOMATICALLY COMPENSATING FOR VARIATIONS IN OUTPUT RESPONSE CHARACTERISTICS OF SENSORS AND THE LIKE

David Townzen, Winchester, Mass., assignor to Kaye Instruments Inc., Bedford, Mass.

Filed Nov. 2, 1981, Ser. No. 316,999
Int. Cl.³ G01K 7/10
U.S. Cl. 364—571 **14 Claims**



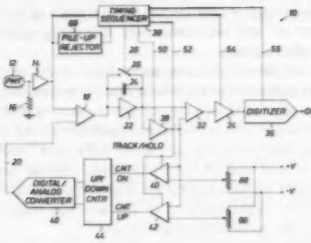
1. A method of compensating for variations between the output signal response characteristic curve of a measurement sensor and the output signal response curve of an ideal reference sensor, wherein the curves indicate the output signal response for different input stimuli, said method comprising providing a first-value input stimulus; determining and storing a first signal variation between the output signal of the measurement sensor and the output signal of the reference sensor for said first-value stimulus; substantially superimposing said characteristic curves at a first point thereon to compensate for said first signal variation; providing a second-value input stimulus; determining and storing a second signal variation between the output signal of the measurement sensor and the output signal of the reference sensor for said second-value input stimulus; relatively pivoting said characteristic curves about said first point so as to substantially superimpose said curves at a second point to compensate for said second signal variation; and thereafter, dependent upon said superposition of curves, automatically correcting the output signal of the measurement sensor, in subsequent measurement use, so as to compensate for the variations between the actual measurement sensor output signal and the ideal reference sensor output signal for input stimuli in the range between said points.

4,481,597

BOREHOLE SPECTRAL ANALOG TO DIGITAL CONVERTER

Carl A. Robbins, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 16, 1981, Ser. No. 312,053
Int. Cl.³ G06J *1/00*; G01V *5/00*; H03K *13/20*
U.S. Cl. 364—604 **11 Claims**



1. A system for converting analog output signals from a photomultiplier tube into digital signals proportional in magnitude to the charge current generated by the photomultiplier tube for use in a well logging system in a borehole penetrating earth formation, comprising:

(a) differential amplifier means having a first input terminal for an input from a photomultiplier analog source and a second input for an offset error cancellation source to form an output signal;

(b) means for integrating the output signal from said differential amplifier means under the control of a timing sequencer and producing an output signal;

(c) means for generating an offset error cancellation signal, said means being responsive to an offset error detecting means;

(d) means for generating, according to a predetermined relationship, timing signals in a predetermined sequence in response to a photomultiplier analog output signal;

(e) means for sampling and holding said integrating means output signal in response to a timing signal from said timing sequencer; and

(f) means for digitizing the output signal from said sampling and holding means to provide a digital word output signal.

8. A system for converting light scintillations from a radiation scintillation detector into digital signals representative of the intensity of such light scintillations for use in a downhole well logging tool comprising:

a photomultiplier tube optically coupled to a radiation scintillation detector and having a load resistor for developing output voltage pulses thereacross proportional to current charge pulses produced in said photomultiplier by radiation entering said scintillation detector;

an input differential amplifier having an output current signal and a first input terminal connected to receive said output voltage pulses from said photomultiplier and a second input terminal connected to receive a feedback correction voltage;

integrator amplifier means having an input terminal connected to receive said output current signal from said input differential amplifier for generating an output voltage signal proportional to the total current applied to said integrator input;

means for generating said feedback correction voltage as a function of any DC error component voltage generated by the sum of any amplifier offset voltage error, integrator current error, and photomultiplier tube DC noise component;

sample and hold means for sampling and holding a peak value of said output voltage signal from said integrator amplifier means and for providing an output signal representative thereof; and

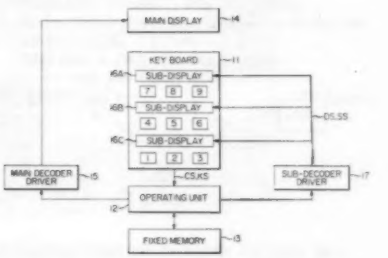
digitizer means connected to said sample and hold means for producing a digital output signal representative of said output signal from said sample and hold means.

4,481,598

ELECTRONIC EQUIPMENT HAVING A SECOND FUNCTION KEYING SYSTEM

Junichi Ishiwata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,187
Claims priority, application Japan, Mar. 9, 1981, 56-32429
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—710 **9 Claims**



1. An electronic equipment comprising:

keyboard means including a plurality of keys each operable to enter at least one assigned function into said equipment;

function display means for displaying the function assigned to each of said keys and arranged so that each said displayed function corresponds to the one of said plurality of keys on said keyboard means to which the function is assigned; and

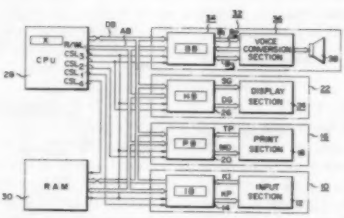
control means connected to said plurality of keys and to said function display means for erasing display of all functions of all of said keys except for the display of the function of a desired one of said keys which is operated.

4,481,599

VOICE DATA OUTPUT DEVICE PROVIDING OPERATOR GUIDANCE IN VOICE FORM

Tetsuo Ootsuka, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 259,817, May 4, 1981, abandoned. This application Oct. 12, 1983, Ser. No. 540,910
Claims priority, application Japan, May 12, 1980, 55-62392
Int. Cl.³ G06F *3/16*
U.S. Cl. 364—710 **4 Claims**



1. A voice data output apparatus comprising:

input means having numerical keys for inputting numerical data and function keys for indicating types of operations,

said input means inputting data in accordance with a predetermined key operation sequence;

control means coupled to said input means for performing a specified operation in accordance with an input signal from said input means to produce next operator guidance data corresponding to that key among said numerical and function keys which is to be operated next; and

voice output means coupled to said control means for automatically and repetitively producing in vocal sound said next operator guidance data delivered from said control means, until said key corresponding to said next operator guidance data is operated.

4,481,600

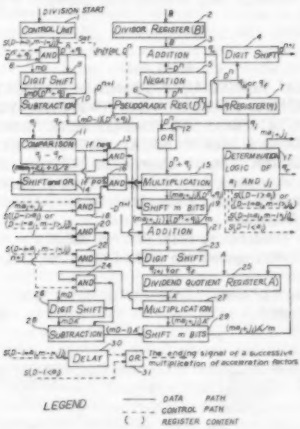
APPARATUS FOR SPEEDING UP DIGITAL DIVISION IN RADIX-2^n MACHINE

Hitohisa Asai, 892 Catalina Dr., Newport News, Va. 23602

Filed Mar. 26, 1982, Ser. No. 362,071

Int. Cl.³ G06F 7/52

U.S. Cl. 364—765 **8 Claims**



1. An apparatus for speeding up convergence division computation for producing a quotient by performing successive multiplication operations comprising:

divisor register means for receiving and storing a divisor quantity B,

dividend/quotient register means for receiving and storing A′, wherein the initial A′ is a dividend quantity A,

pseudoradix register means for receiving and storing a predetermined pseudoradix D^n, wherein D is the radix and n is an integer,

first means, connected to said pseudoradix register means and said divisor register means, to compute a quantity $q_0=B-D^n$,

q register means, connected to said first means, to receive and store q_i, wherein $i=0,1,\ldots,$

logic means, connected to said q register means, to determine acceleration factors a_i and j_i, acceleration constant ma_i+j_i, and q_i, wherein m is an integer chosen from a set $\{1,2,2^2,2^3,\ldots,D\}$, and to generate control signals corresponding to each condition (1) $((D-1>a_i)$ or $(D-1=a_i$ and $m-1>j_i))$, (2) $(D-1=a_i$ and $m-1=j_i)$, and (3) $(D-1<a_i)$, by table lookup of an ls-subdivision table using q_i wherein table entries comprise interval quantities and roots of q_i,

second means, connected to said pseudoradix register means and said q register means, to compute D^n+q_i,

third means, connected to said logic means, to selectively generate acceleration constant ma_i+j_i and modified acceleration constant $(2ma_i+2j_i+1)/2$,

first multiplication means, connected to said second means and to said third means, to compute $(ma_i+j_i)(D^n+q_i)$ and $(2ma_i+2j_i+1)(D^n+q_i)/2$,

fourth means, connected to said logic means and said second means, to compute $(mD-1)(D^n+q_i)$,

first shift means, connected to said first multiplication means, said fourth means, and said logic means, to selectively shift $(ma_i+j_i)(D^n+q_i)$ and $(mD-1)(D^n+q_i)$ by m bits,

fifth means, connected to said pseudoradix register means, to compute D^{n+1},

sixth means to combine the outputs of the first shift means and the fifth means,

seventh means, responsive to said control signals corresponding to conditions (1) $((D-1>a_i)$ or $(D-1=a_i$ and $m-1>j_i))$ and (2) $(D-1=a_i$ and $m-1=j_i)$, for passing 1 and n+1 respectively,

second shift means, connected to said sixth means, sand seventh means, and said q register means, for computing q_i for $i>0$,

second multiplication means, connected to said dividend-/quotient register means and said third means to selectively multiply the acceleration constant and the modified acceleration constant by the output of said dividend/quotient register means, to compute a successive A′ by $A'(-ma_i+j_i)$ and a successive A′ by $A'(2ma_i+2j_i+1)/2$,

eighth means, connected to said dividend/quotient register means and said logic means, to multiply the output of said dividend/quotient register means by $(mD-1)$, to compute a successive A′ by $A'(mD-1)$, and

third shift means, connected to said second multiplication means, said eighth means, said logic means and said dividend/quotient register means, to selectively shift the outputs of said second multiplication means and said eighth means by m bits and to feed the shifted quantity to said dividend/quotient register means.

4,481,601

METHOD AND CIRCUITRY FOR APPROXIMATING THE MAGNITUDE OF A VECTOR

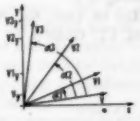
Georg Heinle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,157

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120319

Int. Cl.³ G06G 7/22; G06F 7/38

U.S. Cl. 364—815 **25 Claims**



20. Circuitry for developing a magnitude signal to represent the approximate magnitude of a control parameter vector for the control of a multi-phase electrical apparatus, comprising:

means for measuring physical operating characteristics of the apparatus;

means for deriving coordinate signals from the measured characteristics to represent the Cartesian coordinates of the control parameter vector;

means for forming a plurality of auxiliary vector coordinate signals from the derived coordinate signals to represent respectively a corresponding one of the Cartesian coordinates of an auxiliary vector belonging to a plurality of auxiliary vectors, each of which has the same magnitude

as the control parameter vector but is rotated by a different angle relative thereto; and

means for selecting as the magnitude signal the auxiliary vector coordinate signals having the greatest absolute value.

4,481,602

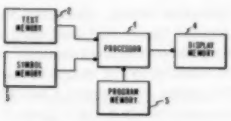
FONT COMPRESSION AND DECOMPRESSION FOR CHARACTER GENERATION

Kathryn A. Bohrer, and Albert D. Edgar, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,602

Int. Cl.³ G06F *5/00, 3/00*

U.S. Cl. 364—900 **15 Claims**



1. In a method for displaying or printing image data stored sequentially in a compressed font memory, the improvement for deriving an address for the beginning of the image data associated with a particular coded character and for displaying or printing said image data, comprising:

multiplying the code of said particular coded character by an approximate pel dimension number to obtain an approximation of an address in said font memory at which said beginning of said image data is stored;

adding a limited range correction factor to said approximation to obtain said address; and

transferring to a display memory or direct display device, image data stored at said address for printing or displaying said stored image data.

4,481,603

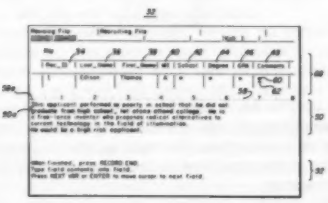
FILE PROCESSING METHOD USING EXPANDING DISPLAY WINDOWS FOR SELECTED RECORDS AND TEXT FIELDS

Rex A. McCaskill; John W. McInroy, and Paul D. Waldo, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,625

Int. Cl.³ G06F *3/14, 7/22*

U.S. Cl. 364—900 **8 Claims**



1. A method for processing a file of information through use of a display screen, a keyboard and a memory store, the file including a plurality of records, each record having a plurality of text fields, comprising the steps of:

reading one of said records from said memory store in response to a command entered through said keyboard;

displaying said record read from said memory store on a first portion of said display screen;

displaying a field symbol in each of said text fields of said record in place of alphanumeric and control characters normally displayed therein;

setting a cursor at a location of one of said field symbols and entering a predetermined command through said keyboard;

opening a text window on a second portion of said display screen in response to said predetermined command;

simultaneously displaying on said second portion of said display screen, the alphanumeric and control characters of the text field corresponding to the field symbol where the cursor is set;

processing the alphanumeric and control characters in said displayed text field in response to commands received through said keyboard to produce a processed text field; and

incorporating said processed text field into said record read from said memory store in response to a command received through said keyboard to produce a processed record.

4,481,604

POSTAL METER USING MICROCOMPUTER SCANNING OF ENCODING SWITCHES FOR SIMULTANEOUS SETTING OF ELECTRONIC ACCOUNTING & MECHANICAL PRINTING SYSTEMS

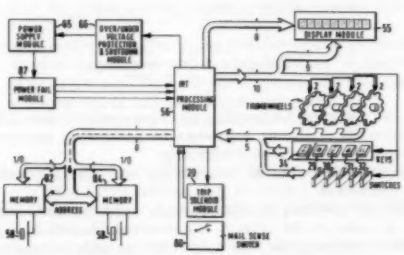
Dennis T. Gilham, Ongar; Thomas D. Williams, Billericay; Manickam Ananthan, London, and William J. Herring, Dagenham, all of England, assignors to Roneo Alcatel Limited, Romford, England

Filed Jul. 6, 1981, Ser. No. 280,871

Claims priority, application United Kingdom, Jul. 9, 1980, 8022527

Int. Cl.³ G06F *15/20, 13/06, 15/02, 3/02*

U.S. Cl. 364—900 **21 Claims**



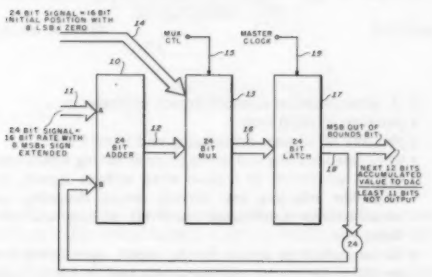
1. A postal franking meter for a franking machine comprising an electronic accounting system and a mechanical printing system together with means for simultaneously setting them including a plurality of printing members allocated respectively to the numerical orders of the maximum value to be franked by the machine, each printing member being adjustable for printing any one of a series of rational numbers, elements respectively mechanically connected to said printing members for setting said printing members to print required values, a printing circuit board assembly comprising at least one printed circuit board, a plurality of switch arrays each consisting of five stationary switch conductors each printed in said printed circuit board assembly and comprising two electrically connected portions respectively allocated to two 1 out of 5 binary codes for an associated decimal digit to be printed, a plurality of contact units respectively connected for setting by said elements and allocated respectively to said switch arrays and rotatably mounted on said printed circuit board assembly for selecting two 5-bit words from each said array, a microcomputer mounted in said printed circuit board assembly,

five inputs printed in said printed circuit board assembly and respectively connecting said microcomputer to all of said stationary switch conductors in each said array, said microcomputer being operative electronically to scan in successive cycles each array of stationary switch conductors, each array having a pair of contacts in succession as selected by the associated one of said contact units, said microcomputer being further operative to combine the two five-bit words thus obtained to provide a decimal digit to be expressed by the microcomputer in four-bit binary coded decimal notation and associated with four check bits to give an eight-bit word with high immunity from error, duplicate random access memories mounted in said printed circuit board assembly, writing means incorporated with said microcomputer and connected in said printed circuit board assembly to enter into inputs of said duplicate random access memories said eight-bit words as well as said values received by said computer through said five inputs, said computer being organized for each franking operation of the meter to update said memories and compare the values registered in said memories as a check to their status, a seven segment electrically activated display module mounted in said printed circuit board assembly, means in said printed circuit board assembly interconnecting said display module and said duplicate memories and said microcomputer whereby said module can display values depending on the decimal digits provided by said microcomputer, individual scanning lines printed in said assembly connected in individual pairs respectively to said rotatable contact units, the arrangement being such that the total number of said scanning lines is ten, a binary to decimal decoder in said printed circuit board assembly connected to said scanning lines, a binary counter in said printed circuit board assembly interposed between said microcomputer and said binary to decimal decoder whereby said decoder is controlled by said microprocessor to deliver two successive signals to said rotary contact units in turn thereby scanning said rotary units in sequence, push button operated switches connected to said microcomputer by way of selected ones of said scanning lines for controlling the display of information in said display module including information stored in said memories and an electrical power distribution network incorporated in said printed circuit board assembly for supply of power to said microcomputer, said memories and said display module, said distribution network being adapted for connection to a power source external to said printed circuit board assembly.

4,481,605
DISPLAY VECTOR GENERATOR UTILIZING SINE/COSINE ACCUMULATION

Karl L. Chase, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 354,972
Int. Cl.³ G06F *3/153*
U.S. Cl. 364—719 **24 Claims**


24 BIT SIGNAL + 16 BIT INITIAL POSITION WITH 8 LSB's ZERO
MUX CTL
MASTER CLOCK
24 BIT SIGNAL + 16 BIT RATE WITH 8 MSBs SIGN EXTENDED
24 BIT ADDER
24 BIT MUX
24 BIT LATCH
MSB OUT OF ROUNDS BIT
NEXT 12 BITS ACCUMULATED VALUE TO DAC
LEAST 12 BITS NOT OUTPUT

1. Vector generator apparatus for a display having X and Y display axes and X and Y deflection means therefore, respectively, said deflection means being responsive to digital X and Y deflection signals, respectively, each comprising a predetermined number of bits, said apparatus comprising

a source of a digital X rate signal,

a source of a digital Y rate signal,

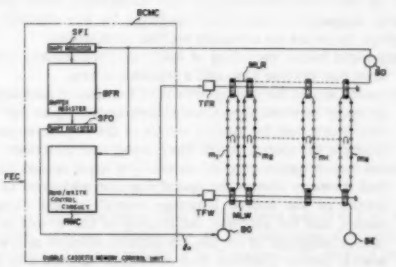
X accumulator means providing a digital output signal having a greater number of bits than said predetermined number, the most significant bits thereof providing said digital X deflection signal, said digital X rate signal comprising fewer bits than said X accumulator means and being applied to said X accumulator means for repetitive accumulation thereof with respect to the least significant bits thereof, so as to incrementally change said X deflection signal in a linear fashion, and

Y accumulator means providing a digital output signal having a greater number of bits than said predetermined number, the most significant bits thereof providing said digital Y deflection signal, said digital Y rate signal comprising fewer bits than said Y accumulator means and being applied to said Y accumulator means for repetitive accumulation with respect to the least significant bits thereof, so as to incrementally change said Y deflection signal in a linear fashion.

4,481,606
FILE DELETION METHOD IN BUBBLE CASSETTE MEMORY, AND BUBBLE CASSETTE MEMORY CONTROL APPARATUS

Ryoichiro Nozawa, Tokyo, and Nobuyuki Kiya, Hachioji, both of Japan, assignors to Fanuc Limited, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,213
Claims priority, application Japan, Sep. 25, 1980, 55-133306
Int. Cl.³ G11C *19/08, 11/14*
U.S. Cl. 364—900 **13 Claims**



6. A file deletion apparatus for deleting a specified file F_n from a bubble cassette memory, and for storing files in the bubble cassette memory, the bubble cassette memory having a capacity for storing data corresponding to a predetermined number of files in a sequence, each file having a predetermined number of blocks comprising a predetermined number of bytes, said apparatus including;

dividing means, operably connectable to the bubble cassette memory, for receiving the data and for dividing the predetermined number of files into the predetermined number of blocks, each block comprising the predetermined number of bytes, and for inserting a control byte into the first byte of each of the blocks;

determining means, operably connectable to the bubble cassette memory, for determining when a block comprising a control byte is the first block of a file;

writing means, operatively connected to the dividing means, for writing into each control byte, control information indicating that the block associated with the control byte is the first block of a file;

means for generating a deletion command initiating the deletion of the specified file F_n from the predetermined number of files stored in the bubble cassette memory;

reading means responsive to the deletion command and

operably connectable to the bubble cassette memory, for destructively reading from the bubble cassette memory, the specified file F_n and files sequentially following the specified file F_n;

temporary memory means for storing the files sequentially following the specified file F_n and read by said reading means; and

means for storing the files stored in said temporary storage means, in the bubble cassette memory, starting at the location at which the specified file F_n was originally stored and in the same sequence as the files sequentially following the specified file F_n were originally stored.

4,481,607

ELECTRONIC DICTIONARY

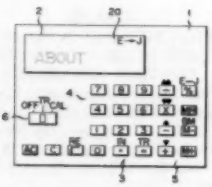
Saburo Kobayashi, and Takao Yoshida, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,582

Claims priority, application Japan, Dec. 25, 1980, 55-184441

Int. Cl.³ G06F *15/14, 15/02*

U.S. Cl. 364—900 **10 Claims**



1. an electronic dictionary which translates a word from a source language to an object language by key control and displays the word on a display section, comprising:

key input means including at least one forward key and at least one reverse key, and a translation key;

memory means for storing words of the source language in an order of word arrangement corresponding to that of a dictionary, and for storing words of the object language, wherein the stored words have associated addresses;

word search means coupled to said key input means and to said memory means for specifying the addresses of the words of the source language stored in said memory means, and for enabling the display of the words of the source language on the display section, wherein said word search means specifies said addresses sequentially in a forward order of the stored word arrangement in response to operation of said forward key, and specifies said addresses sequentially in a reverse order of the stored word arrangement in response to operation of said reverse key; and

translation means coupled to said key input means and to said memory means for selecting from said memory means that word of the object language which corresponds to the translation of the word of the source language in response to operation to said translation key wherein said translation means is operative to specify the address of the word of the object language, and for enabling the display of the word of the object language the address of which is specified, on the display section.

4,481,608

REENTRANT ASYNCHRONOUS FIFO

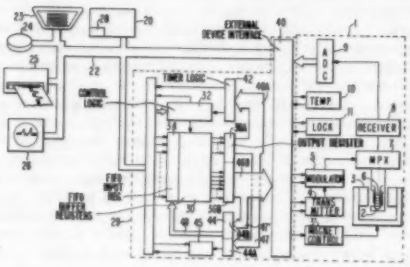
Edward H. Berkowitz, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 107,106, Dec. 26, 1979, Pat. No. 4,375,676. This application Mar. 1, 1982, Ser. No. 353,263

Int. Cl.³ G06F *3/00, 7/00*

U.S. Cl. 364—900 **5 Claims**

1. In a sequence buffer comprising an input register, an output register, and a plurality of intermediate registers disposed sequentially between said input register and said output register, each said register adapted to hold a digital word, each said digital word comprising a plurality of bits, means for normally concurrently transferring the content of each said input and intermediate register to registers adjacent thereto in discrete steps toward and into said output register, the improvement comprising: feedback means communicating with said output register for returning each said digital word transferred thereinto to said input register whereby the sequence of digital words defined by the initial content of said sequence buffer is preserved and said transferring is controlably cycled through said sequence buffer; and persistence control means responsive to a persistence portion of the digital word transferred to said output register for retaining the content of said output buffer for an interval of time determined by said persistence portion.



4,481,609

SEMICONDUCTOR MEMORY MINIATURIZED BY LINE GROUPS AND STAGGERED CELLS

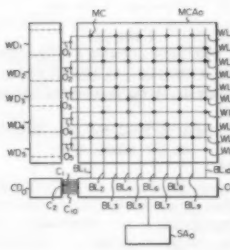
Mitsuo Higuchi, Tokyo, and Atsushi Takeuchi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 19, 1982, Ser. No. 409,404

Claims priority, application Japan, Aug. 19, 1981, 56-128803

Int. Cl.³ G11C *5/02, 5/06*

U.S. Cl. 365—72 **14 Claims**



1. A semiconductor memory device comprising:

a plurality of word lines;

a plurality of bit lines intersecting said word lines;

a word-line selecting and driving circuit having inputs operatively connected to receive word address signals, said word-line selecting and driving circuit decoding said word address signals and selectively driving said word lines;

a bit-line selecting circuit having inputs operatively connected to receive bit address signals, said bit-line selecting circuit decoding said bit address signals and selecting one of said bit lines; and

a plurality of memory cells respectively arranged at the intersections between said word lines and said bit lines;

said word-line selecting and driving circuit having outputs, each of which is commonly connected to a respective one of a plurality of sets of plural adjacent word lines;

said memory cells being arranged only at the intersections between one of the adjacent word lines in each one of said sets and one of said bit lines, and between another of the adjacent word lines in said each one of said sets and another of said bit lines.

4,481,610

DYNAMIC SEMICONDUCTOR MEMORY DEVICE

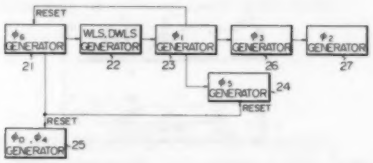
Yoshihiro Takemae, and Hatsuo Miyahara, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 24, 1982, Ser. No. 444,487

Claims priority, application Japan, Nov. 27, 1981, 56-190370

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—182 **4 Claims**



1. A dynamic semiconductor memory device, operatively connected to receive a control signal, having word lines, a pair of bit lines intersecting the word lines and a sense amplifier operatively connected to the bit line pair, comprising:

a selected real cell operatively connected to a first one of the word lines and a first bit line of the pair of bit lines; and

an active restore circuit, operatively connected to the pair of bit lines, including bit line pull-up transistors, each of said bit line pull-up transistors operatively connected between the bit line pair and a high potential source level, the control signal being supplied to each of said bit line pull-up transistors after actuation of the sense amplifier, each of said bit line pull-up transistors being turned on so that the bit line pair is pulled up to the high potential source level, the level of said control signal being maintained at a voltage potential level lower than the ground level before or at the time of actuation of the first one of the word lines to the time of actuation of the sense amplifier.

4,481,611

SEISMIC CABLE COMPASS SYSTEM

Eric C. Burrage, Pearland, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 115,460, Jan. 25, 1980, abandoned. This application Jun. 3, 1981, Ser. No. 270,047

Int. Cl.³ G01V *1/38*

U.S. Cl. 367—19 **8 Claims**

4. An apparatus for determining the position of a marine streamer cable towed behind a survey vessel, said apparatus comprising:

a plurality of pod members, said pod members being secured to the exterior of said marine streamer cable at spaced preselected positions;

a plurality of gimbaled magnetic compasses, one of said compasses being mounted in each of said pods to sense the magnetic heading of a line tangent to the longitudinal axis of the streamer cable;

telemetry means disposed in each of said pods and coupled to said compass, said telemetry means producing a signal representing said magnetic heading; and,

inductive means, said inductive means comprising a first inductive coil disposed in each of said pods and a second inductive coil disposed in said marine streamer cable opposite said first inductive coil, said first inductive coil being coupled to said telemetry means and said second inductive coil being coupled to a pair of conductors in said cable.

4,481,612

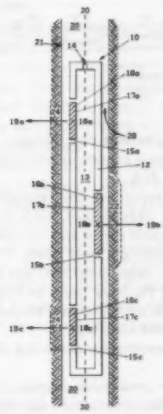
SEISMIC SURVEYING USING SHEAR WAVES

John W. Curran, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Oct. 10, 1980, Ser. No. 196,008

Int. Cl.³ G01V *1/053, 1/40*

U.S. Cl. 367—75 **29 Claims**



17. A method for generating seismic shear waves in a zone of the earth, wherein substantially no pressure wave is generated in portions of a selected plane in the zone, said method comprising:

applying a first force at a first source point substantially in the selected plane, and along a first line substantially normal to the selected plane to generate a first shear wave in the selected plane;

applying a second force at a selected second source point substantially in the selected plane, and in a direction substantially opposite to the direction of the first force, said second force having a magnitude substantially twice the magnitude of the first force, in order to generate a second shear wave in the selected plane which, at any distant observation point in the selected plane, lags the first shear wave in phase by a predetermined amount; and

applying a third force at a selected third source point substantially in the selected plane, and in a direction substantially opposite to the direction of the second force, said third force having a magnitude substantially equal to the magnitude of the first force, in order to generate a third shear wave in the selected plane which, at the distant observation point, lags the second shear wave in phase by the same predetermined amount, such that the first, second and third shear waves will interfere constructively at the distant observation point to produce a resonance, and so that no reactive force associated with any of said first, second, and third forces, which reactive force is not also one of said first, second, and third forces, is applied to the

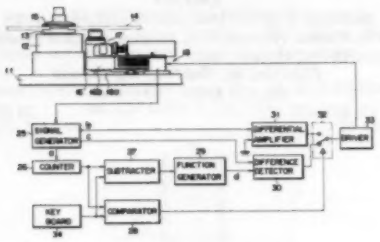
zone of earth, and so that the reaction forces associated with said first, second, and third forces substantially cancel.

4,481,613

OPTICAL DISK APPARATUS

Tsuneshi Yokota, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 30, 1982, Ser. No. 373,788
Claims priority, application Japan, May 1, 1981, 56-66479
Int. Cl.³ G11B *21/08*
U.S. Cl. 369—56 **4 Claims**



1. An optical disk apparatus comprising:

a linear motor having a carrier movable in the radial direction of an optical disk;

an optical head for recording and reproducing information on and from the optical disk, said optical head being mounted on said linear motor and including a semiconductor laser for generating a laser beam, focusing means for focusing the laser beam onto said optical disk, tracking means for causing the laser beam to follow a given track on said optical disk, and detecting means for detecting the state of focusing and tracking;

a position detecting section for detecting the position of said optical head;

specifying means for specifying a desired target position;

position difference detecting means for detecting the difference between the position detected by said position detecting section and the target position specified by said position specifying means; and

driving means for moving the carrier of said linear motor by a distance corresponding to a position difference detected by said position difference detecting means.

4,481,614

VELOCITY CORRECTION APPARATUS FOR DISC RECORD PLAYER

Byron K. Taylor, Carmel, and Myron C. Stewart, Coatesville, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,644
Int. Cl.³ G11B *21/26*
U.S. Cl. 369—43 **10 Claims**

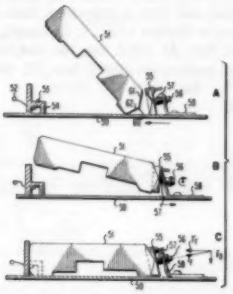
1. Signal recovery apparatus for a disc record player including a cartridge having top and side walls and being removably mounted in a carriage assembly for translating the cartridge radially across a disc record, said cartridge including a signal pickup transducer attached to a first end of a longitudinal transducer arm, the second end of which is suspended within an enclosure defined by said cartridge top and side walls and proximate the rearmost end thereof, and including transducer-disc relative velocity correction apparatus comprising:

a permanent magnet fixed to the second end of the transducer arm and having its polar axis parallel with the longitudinal axis of the transducer arm;

an electromagnetic coil responsive to velocity correction signals for generating time varying magnetic fields to influence the position of said permanent magnet, said coil located proximate the second end of the transducer arm and coaxial with the polar axis of said permanent magnet;

means for supporting said coil including:

a. an element having a first surface and a second surface opposite thereto, said coil being secured to the first surface with its axis perpendicular to said first surface, said first surface having recesses astride said coil for receiving conformally therein rearmost extremities of said cartridge sidewalls thereby aligning the coil axis with the permanent magnet;



b. a stemlike member protruding from said second surface having a long axis generally parallel with the axis through said coil;

c. a bracket secured to said carriage, said bracket having an aperture for loosely receiving said stemlike member therethrough, the plane including the aperture being generally perpendicular to the long axis of the transducer arm when in its normally operative position; and

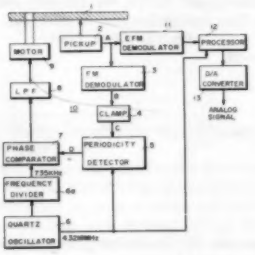
d. bias means for urging said coil support means away from the bracket in the direction to seat the cartridge in its operative position.

4,481,615

MOTOR CONTROLLING CIRCUIT OF REPRODUCING APPARATUS AND METHOD OF CONTROLLING

Toshiaki Hioki, Gifu, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jan. 26, 1982, Ser. No. 342,904
Claims priority, application Japan, Feb. 2, 1981, 56-14686; Jun. 9, 1981, 56-89346; Jul. 23, 1981, 56-116099
Int. Cl.³ G11B *17/00*
U.S. Cl. 369—50 **18 Claims**



1. A motor controlling circuit of a reproducing apparatus, comprising:

a recording medium having digital data and a synchronizing signal for synchronization of said digital data recorded thereon,

said digital data being digitally recorded on said recording medium in the form of run length limited code,

said synchronizing signal being, so digitally recorded on said recording medium that a signal inversion thereof is equal or greater than a maximum of a signal inversion interval appearing in said digital data recorded in said run length limited code format,

a motor for driving said recording medium,

reproducing means for reproducing said digital data and synchronizing signal from said recording medium being driven by said motor,

FM demodulating means for FM demodulating the signal as reproduced by said reproducing means,

control signal generating means for generating a control signal based on the FM demodulated signal as FM demodulated by said FM demodulating means, and

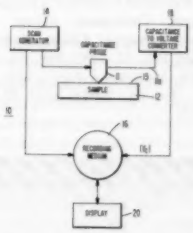
rotational speed controlling means responsive to said control signal generated by said control signal generating means for controlling the rotational speed of said motor.

4,481,616

SCANNING CAPACITANCE MICROSCOPE

James R. Matey, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,021
Int. Cl.³ G11B *9/06*
U.S. Cl. 369—58 **21 Claims**



1. A method for determining variations in the topography and material properties of the surface layer of a body of material comprising:

(a) scanning said surface layer with a capacitance probe to generate a first signal representing capacitance variations between the surface layer and said probe;

(b) scanning a recording medium in synchronism with the scanning of the surface layer with said probe;

(c) recording said first signal on the recording medium as a second signal; and

(d) generating a visual display from said second signal from said recording medium presenting thereby capacitance variations as visually discernible variations of an image consisting of points which correlate on a one-to-one basis with points on the surface layer, the image variations manifesting features of the surface layer which cause variations in capacitance between the surface layer and the capacitance probe.

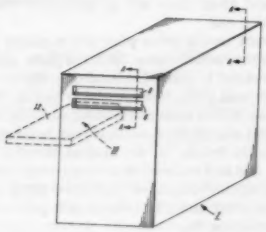
17. A method of microscopy comprising continuously scanning the surface of a body with only one capacitance probe by providing relative movement between the surface and the probe to generate a continous signal representing the variation in capacitance between the body and the probe, and processing the signal to produce an image of the topography and material properties of the surface layer.

4,481,617

MEMORY DISC DRIVE

C. Thomas Mabry, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 420,983
Int. Cl.³ G11B *17/04, 3/00*
U.S. Cl. 369—77.2 **9 Claims**



1. A drive utilized in conjunction with a framed memory disc member contained within a sleeve when said member is not operable in said drive, comprising:

a housing having a front section, said front section having first and second slotted openings therein, each of said openings being sufficiently wide to accept said sleeve;

a driveable spindle member;

first means for providing the removal of said framed member from its sleeve when such sleeve containing the framed member is inserted into said first slotted opening and into operative association with said first means and then withdrawn from said first slotted opening; and

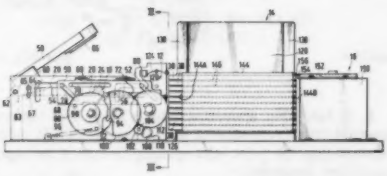
second means for clamping said framed member in an operable position relative to said spindle member when said sleeve is inserted into said second slotted opening and into operative association with said second means.

4,481,618

LOADING DEVICE FOR A RECORDING AND/OR PLAYBACK APPARATUS

Mituhisa Nakayama, Kanagawa, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,542
Claims priority, application Japan, Nov. 19, 1982, 57-202161; Dec. 24, 1982, 57-195236[U]
Int. Cl.³ G11B *17/04, 17/26, 7/00*
U.S. Cl. 369—194 **9 Claims**



1. A loading device for a recording and/or playback apparatus, comprising:

a movable loading support onto which can be slid in a horizontal direction a holder containing a record carrier, the loading support comprising guide means for guiding the holder in its sliding movement onto the loading support and stop means for limiting the extent of this movement,

a guide plate fixed in a vertical plane parallel to the direction of said sliding movement of the holder and formed with L-shaped guide slots each comprising a horizontal section

and a vertical section extending downwardly from the horizontal section at an end thereof,

a drive plate supported for movement in a horizontal direction in a plane parallel to the plane of the guide plate and formed with slots which are inclined to the direction of movement of the drive plate, the loading support comprising pins, each of which engages slidably in an associated one of said guide slots and an associated one of said inclined slots, and

a toothed rack on the drive plate and a pinion for cooperation with the rack to move the drive plate, said guide slots being arranged to guide the loading support, by cooperation with said pins, from a rest position, at which the holder can be slid onto the loading support, along a horizontal path and down a vertical path to bring the record carrier in the holder on the loading support to a playing position, and said inclined slots being cooperable with said pins, during movement of the drive plate to move the loading support along and down said paths respectively, characterized in that

an electric motor is arranged to move the drive plate via a transmission which includes the rack and pinion and which comprises means whereby the transmission is disengaged when the drive plate is in a rest position which it occupies when the loading support is in the rest position, and engaged by movement of the drive plate away from the rest position, and

feed rollers are provided for sliding the holder onto the loading support, the feed rollers being arranged to be driven by said electric motor, and the stop means on the loading support being so arranged in relation to the feed rollers when the loading support is in the rest position that after abutting the stop means the holder is moved further by the feed rollers and through the loading support moves the drive plate away from the rest position to effect engagement of said transmission.

4,481,619

TURNTABLE APPARATUS

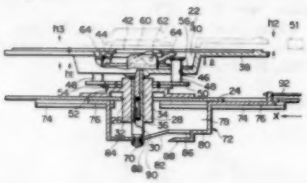
Mikio Oozeki, Saitama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 9, 1982, Ser. No. 347,333

Claims priority, application Japan, Feb. 13, 1981, 56-19936

Int. Cl.³ G11B *17/04*

U.S. Cl. 369—270 **9 Claims**



1. A turntable apparatus which bears and rotates a disc inserted into a reproducing apparatus for signals recorded on the disc through a disc inlet opening formed in the reproducing apparatus, comprising:

a chassis;

a turntable having a disc mounting surface and a recess in the central portion thereof, and rotatably supported on said chassis to move vertically between a first position where said disc mounting surface is located below said disc inlet opening and a second position where said disc mounting surface is located above said disc inlet opening to bear the disc thereon;

a center spindle having a surface for regulating a disc mounting position, supported coaxially with an axis of rotation of said turntable, and received in said recess to move vertically between a third position where said surface for regulating the disc mounting position is located below said disc mounting surface and a fourth position where said surface for regulating the disc mounting position is located above said disc mounting surface to regulate the disc mounting position; and

moving means for moving said center spindle from said third position to said fourth position as said turntable moves from said first position to said second position, and for moving said center spindle from said fourth position to said third position as said turntable moves from said second position to said first position, wherein said moving means includes at least one pin capable of engaging said chassis with its upper end located in said recess and its lower end penetrating the bottom of said recess to be led out downward, and at least one regulating member rockably mounted on the bottom of said recess and having one end portion engaging said center spindle and the other end portion engaging the upper end portion of said pin.

4,481,620

PREGROOVED OPTICAL-DISK

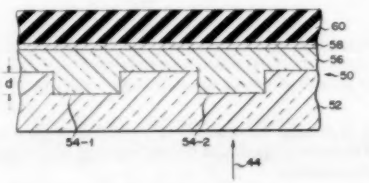
Teruo Murakami, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 22, 1982, Ser. No. 351,211

Claims priority, application Japan, Mar. 24, 1981, 56-42891

Int. Cl.³ H04N *7/00, 23/00*

U.S. Cl. 369—275 **10 Claims**



1. A pregrooved optical-disk having a preformed tracking groove onto which a laser beam is radiated, said pregrooved optical-disk comprising:

(a) a first layer of a transparent substance having a first refractive index n_1 having a surface containing said tracking groove;

(b) a second layer of a transparent material having a second refractive index n_2 having a first surface in contact with said surface of said first layer and covering said tracking groove, said second layer having a substantially flat second surface opposite said first surface;

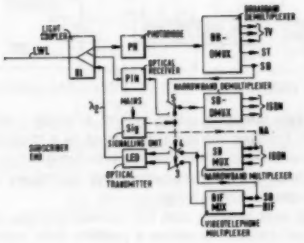
(c) said tracking groove having depth which is a function of the difference between said first and second refractive indices; and

(d) a recording layer provided on said second surface of said second layer, onto which the laser beam is incident through said first and second layers, said recording layer being of a substance that is meltable by said laser beam when an energy level of said laser beam exceeds a predetermined level.

4,481,621
SERVICE INTEGRATED DIGITAL SIGNAL TRANSMISSION SYSTEM

Hans-Jürgen Schmack, Allmersbach, and Erich Rauth, Auenwald, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 24, 1981, Ser. No. 324,662
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044605
Int. Cl.³ H04B 9/00
U.S. Cl. 370—3 10 Claims

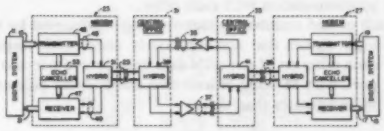


1. In a service integrated, time multiplex digital signal transmission system for transmitting narrowband and broadband signals between a central exchange terminal and a subscriber terminal, which system includes means defining an optical fiber waveguide path connected between the terminals, a transmitter device at one terminal composed of sources of such narrowband and broadband signals and multiplexing means connected for combining the signals provided by the sources into a multiplex signal and for supplying such multiplex signal to the optical fiber waveguide path, and a receiver device at the other terminal composed of demultiplexing means connected to the optical fiber waveguide path for receiving multiplex signals from that path and separating the received multiplex signals into narrowband signals and broadband signals, the improvement wherein said device at said subscriber terminal is normally supplied with operating power by local utility mains, and said system further comprises: a charge accumulator for supplying operating power independently of the local mains, connected for supplying such power to said device at said subscriber terminal in the event of interruption of the power supply provided by the local mains; first switching means at said one terminal connected to said multiplexing means and arranged to produce a switching signal for causing said multiplexing means to supply a signal at a reduced bit rate; and second switching means at said other terminal connected to said demultiplexing means and arranged to produce a switching signal for causing said demultiplexing means to process the signal at a reduced bit rate; with that one of said switching means which is at said subscriber terminal being connected to produce its switching signal in response to a local mains power interruption and that one of said switching means which is at said central exchange terminal being connected to produce its switching signal in response to an indication, transmitted via said waveguide path, of production of the switching signal by said switching means at said subscriber terminal, whereby said system is switched to effect signal transmission at a reduced bit rate in the event of such local mains power interruption.

4,481,622
HIGH SPEED DIAL-UP TELEPHONE CIRCUIT FULL DUPLEX DATA TRANSMISSION TECHNIQUES

King Y. Cheng, Tustin, and Arthur J. Carlson, Cupertino, both of Calif., assignors to Anderson Jacobson, Inc., San Jose, Calif.

Filed Apr. 1, 1982, Ser. No. 364,320
Int. Cl.³ H04B 1/50
U.S. Cl. 370—30 7 Claims



1. A telephone modem capable of simultaneously transmitting and receiving data signals with less than a given error rate over a common dial-up telephone circuit of a given usable bandwidth, comprising:

means converting digital data into analog signals for transmitting said analog signals through said telephone circuit in a first portion of its said usable bandwidth,

means receiving analog signals from said telephone circuit for converting those signals within a second portion of said usable bandwidth into digital data,

said first and second bandwidth portions each being a different substantially one-half of said telephone circuit bandwidth and arranged to occupy substantially the entire telephone circuit bandwidth, said first and second bandwidth portions overlapping in frequency passband in about the middle of said useable bandwidth and in an amount that local signal echo would normally result in an error rate in excess of said given error rate but remote signal echo would normally result in an error rate less than said given error rate, and

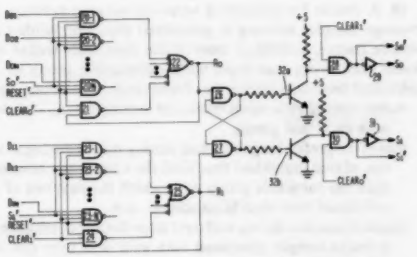
means connected between said transmitting and receiving means for subtracting from a received signal any portion of a transmitted signal within the overlapping portion of said first and second bandwidth portions, thereby to suppress the local echo and reduce the error rate from echos to something less than said given rate,

whereby utilization of the given telephone circuit bandwidth for rapid data communication is maximized.

4,481,623
SPEED INDEPENDENT ARBITER SWITCH EMPLOYING M-OUT-OF-N CODES

Becky J. Clark, Del Mar, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 23, 1982, Ser. No. 443,967
Int. Cl.³ H04J 6/00
U.S. Cl. 370—60 9 Claims



1. An arbiter comprised of:

two input ports and one output port, each of said input ports

having N input data lines and said one output port having N output data lines;

means for selecting only one of said two input ports at a time in response to an active logic signal on any one of the N input data lines in that port when neither input port is already selected; and

means for passing the bits of multibit characters from said selected input port to said output port in parallel and in synchronization with each other;

each of said multibit characters being represented by active logic signals that asynchronously occur with respect to each other on M-out-of-N data lines on said selected input port, with M being at least two and N being greater than M and greater than three.

4,481,624

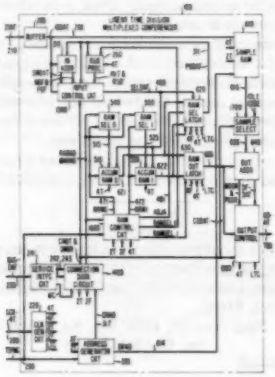
LINEAR TIME DIVISION MULTIPLEXED CONFERENCER

Lawrence Baranyai, Holmdel; John R. Colton, Freehold; Michael S. Lane, Colts Neck, all of N.J., and Thomas P. Sosnowski, Wayland, Mass., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 24, 1982, Ser. No. 391,698

Int. Cl.³ H04M *3/56*

U.S. Cl. 370—62 **17 Claims**



16. A circuit for processing received message samples, said message samples arriving in associated time slots within successive frames, individual ones of the time slots within each frame each being associated with a respective group of said individual time slots within that frame, said circuit comprising,

means operative in each frame for storing a sum associated with each said group,

means for prefetching from said storing means during at least one of said individual time slots the stored sum associated with the particular group with which the next one of said individual time slots is associated, and

means operative during said next time slot for combining the message sample associated with said next time slot with said prefetched stored sum to generate an updated sum associated with said particular group and for applying said updated sum to said storing means for storage as the sum associated with said particular group.

4,481,625

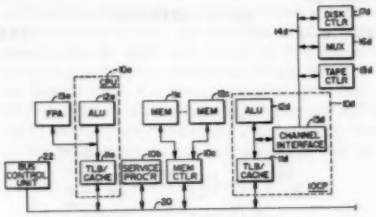
HIGH SPEED DATA BUS SYSTEM

Allen W. Roberts, Union City; Harold L. McFarland, Jr., Santa Clara, and Harlan Lau, Campbell, all of Calif., assignors to Elxsi, San Jose, Calif.

Filed Oct. 21, 1981, Ser. No. 313,524

Int. Cl.³ H04J *3/12*

U.S. Cl. 370—85 **31 Claims**



1. In a data communication system wherein a sending unit operates to transmit information quanta to a receiving unit, a transfer consisting of either one information quantum or multiple information quanta transmitted over successive bus cycles, the improvement comprising:

means in said sending unit for communicating along with each information quantum a position field representative of the relative position of the accompanying information quantum within the transfer;

screening means is said receiving unit operative to accept or reject an information quantum; and

means in said receiving unit responsive to said position field for constraining said screening means to prevent said screening means from accepting a later information quantum of a multiple-quantum transfer if said screening means rejected an earlier information quantum of the same multiple-quantum transfer.

4,481,626

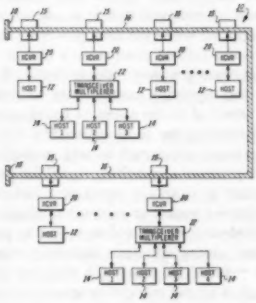
TRANSCEIVER MULTIPLEXOR

David R. Boggs, Palo Alto, and John F. Shoch, Stanford, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 5, 1982, Ser. No. 375,055

Int. Cl.³ H04Q *9/00*

U.S. Cl. 370—85 **6 Claims**



1. A transceiver multiplexor adapted to receive data signals from any one of a plurality of client hosts and transmit them to a communication medium via a transceiver coupled thereto or to any of said client hosts and comprising

means coupled to receive a transmitted data signal from any transmitting client host,

transfer means coupled to said coupling means to receive

said transmitted data signal from any one of said hosts for transfer as an output to said transceiver,

collision detecting means each having one input coupled to an output of a respective client host to receive a transmitted data signal directly from its respective coupling means, and having its other input coupled to receive said transmitted data signal output from said transfer means, the output of each of said collision detecting means coupled as an input to its respective client host,

delay means in said collision detecting means to roughly match the propagation delay through said transfer means,

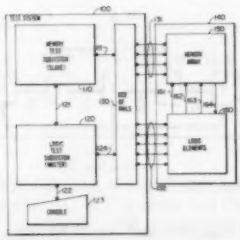
any one of said collision detecting means productive of a collision signal when the time phase of said signals presented at said collision detecting means inputs are not substantially the same over a predetermined minimum time period.

4,481,627

EMBEDDED MEMORY TESTING METHOD AND APPARATUS

Robert C. Beauchesne, Brockton, and Robert J. Russell, Boston, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 30, 1981, Ser. No. 316,720
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—21 **5 Claims**



1. A test system for testing electronic assemblies having both combinatorial logic units and memory array units, said test system comprising:

A. a memory test subsystem for applying input signals to said memory array units, for sensing outputs from said memory array units and for compiling the sensed outputs in a test routine;

B. a logic test subsystem coupled to said memory test subsystem for applying inputs to said combinatorial logic units, for sensing outputs from said combinatorial logic units and for compiling the sensed outputs in a test routine; and

C. a contact means coupled to said memory test subsystem and said logic test subsystem for providing electrical contact with said respective memory array units and combinatorial logic units of said electronic assemblies;

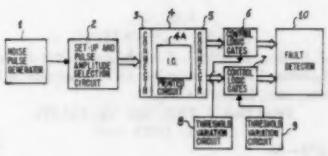
D. said memory test subsystem and said logic test subsystem cooperating to place, under control of the logic test subsystem, all outputs of the logic units which connect to inputs or outputs of a memory array unit under test in a high-impedance state and to inhibit parallel operation of any other memory array unit, the outputs of which are wire-ored with the outputs of the memory array unit under test, such that said electronic assemblies are preconditioned so that each of said memory array units embedded therein can be tested in logical isolation and relative electrical isolation at said memory array unit's rated speed by said memory test subsystem by use of memory test routines.

4,481,628

APPARATUS FOR TESTING DYNAMIC NOISE IMMUNITY OF DIGITAL INTEGRATED CIRCUITS

Rossano Pasquinelli, Sesto S. Giovanni, Italy, assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 24, 1982, Ser. No. 422,622
Claims priority, application Italy, Dec. 15, 1981, 25597 A/81
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—28 **3 Claims**



1. Apparatus for testing dynamic noise immunity of digital integrated circuits comprising:

a generator of noise pulses of predetermined duration and amplitude, said pulses being applied to inputs of an integrated circuit under test;

control logic means having inputs connected to outputs of said integrated circuit under test; and

a fault detection means having inputs connected to outputs of said control logic means, said detection means displaying at least one of two possible working states of said integrated circuit under test;

wherein said control logic comprises:

a first group of logic gates having inputs connected to first outputs of said integrated circuit under test, said first outputs being normally at logic level 0;

a second group of logic gates having inputs connected to second outputs of said integrated circuit under test, said second outputs being normally at logic level 1; and

a circuit means coupled to said first and second group of logic gates and able to vary the input voltage thresholds of said first and second group of logic gates so as to fix a predetermined output logic swing for said circuit under test.

4,481,629

ABNORMAL SIGNAL DETECTING DEVICE

Minoru Hatata, and Tadahiro Gouda, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 261,209, May 6, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,019
Claims priority, application Japan, Dec. 12, 1979, 54-163017
Int. Cl.³ G01R *19/00*; G06F *11/00*
U.S. Cl. 371—57 **2 Claims**

1. An abnormal signal detecting device, comprising:

a sampling circuit means for sampling a predetermined number of data points along alternating current (AC) signal

and generating digital sampled data signal representative thereof;

memory means, connected to said sampling circuit means, for storing said digital sampled data;

consistency detecting circuit means, connected to said memory means, for comparing at least three consecutive digital sampled data signals and generating an output representing an abnormal condition whenever said at least three consecutive digital sampled data signals are the same.

4,481,630

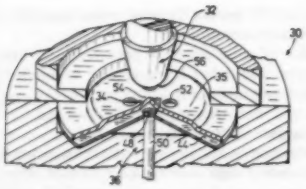
SPARK GAP SWITCH

Stephen J. C. Box; Ronald J. Kovach, and Andre J. Desroziers, all of London, Canada, assignors to Photochemical Research Associates Inc., London, Canada

Filed Dec. 3, 1981, Ser. No. 327,072

Int. Cl.³ H01S *3/09*

U.S. Cl. 372—38 **7 Claims**



1. A spark gap switch comprising a pair of electrodes having opposing areas spaced apart a predetermined distance to establish said spark gap where a main discharge arc occurs between said opposing electrode areas when said spark gap is triggered, said pair of electrodes constituting the opposite and adjacent electrodes of said spark gap switch, a trigger device having a trigger pin spaced apart from a trigger electrode, a solid insulative material provided between said spaced-apart trigger pin and trigger electrode, said insulative material having a high dielectric constant, said adjacent electrode being a disc supported by a perforated plate in front of and spaced from said trigger pin, said trigger pin being surrounded by said high dielectric constant material, said trigger electrode being adjacent the end of said pin to provide a trigger discharge between said pin and trigger electrode, said trigger device being located rearwardly of said adjacent electrode area relative to said adjacent electrode area to position said solid insulative material in a manner to prevent a triggered main discharge arc affecting the structural integrity of said insulative material, electrons and photons generated by a trigger discharge passing through the perforations in said plate in moving towards said opposite electrode.

4,481,631

LOSS STABILIZED BURIED HETEROSTRUCTURE LASER

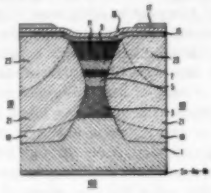
Charles H. Henry, New Providence, and Ralph A. Logan, Morristown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 12, 1981, Ser. No. 273,109

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—45 **10 Claims**

1. In a laser, a light emitting structure comprising an active layer, first and second semiconductor layers on opposing sides of said active layer, said active, first and second layers forming a mesa, said active layer having a width between approximately 2.0 μm and approximately 4.0 μm, a third semiconductor layer contacting opposite side faces of said active and first and second semiconductor layers, said active layer having a bandgap less than the bandgaps of said first and second semiconductor layers, and said third semiconductor layer having an



index of refraction less than the effective index of the mesa by at least approximately 4 percent.

4,481,632

LASER, PARTICULARLY CO_2 GAS TRANSPORT LASER

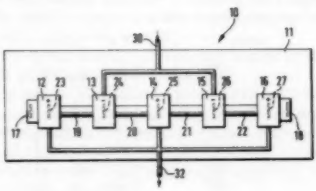
Horst Herbrich, Kelkheim; Rainer Kuchler, Frankfurt am Main, and Erich Streng, Bad Homburg von der Hohe, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,711

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136231

Int. Cl.³ H01S *3/22*

U.S. Cl. 372—58 **5 Claims**



1. In a gas transport laser system having a plurality of discharge sections through which laser gas flows and being attached on mounts, the improvement being in that said mounts have borings for connection of the discharge tube sections as well as for the laser gas intake and the laser gas discharge, said borings being located in said mounts in such a manner that said discharge tube sections and said gas supply and said gas discharge are parallel with one another, an electrode being in each of said mounts, said electrodes in adjacent mounts being of opposite polarity, said electrodes in the end most mounts being of the same polarity, said gas supply communicating with each of said mounts having their electrodes of the same polarity, said gas discharge communicating with the remaining intermediate mounts having their electrodes of opposite polarity to mounts communicating with said gas supply; and a laser mirror being attached to each one of said end most mounts which accommodate said discharge tube sections through which laser gas flows.

4,481,633

WET-JACKET ARGON-ION LASER

William H. McMahan, Salt Lake City, Utah, assignor to Laser Corporation, Salt Lake City, Utah

Filed Jan. 15, 1982, Ser. No. 339,691

Int. Cl.³ H01S *3/03*

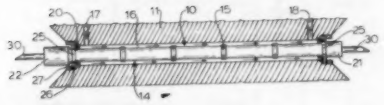
U.S. Cl. 372—62 **7 Claims**

1. In an argon-ion laser of the type having cathode, anode a laser tube and means for optical coupling to and from said tube, the improvement comprising:

(a) a cylindrical-shaped laser tube comprising a plurality of ceramic segments, each segment having an internal cen-

tral core forming a main discharge bore through the laser tube and other bores spaced radially outward therefrom forming gas bypass bores through the laser tube said ceramic segments being brazed and joined together to establish an electrically insulative non-ionized buffer region between said main discharge bore and the outer surface of said laser tube;

(b) anode and cathode assemblies secured to respective opposite anode and cathode ends of said laser tube;



(c) a fluid-containing structure surrounding and enclosing said laser tube between the anode and cathode ends thereof in radially closely-spaced relation to provide a coolant jacket sealed from said anode and cathode ends and having inlet and outlet means associated therewith for passing a coolant fluid through said jacket to surround and cool said laser tube; and

(d) means effective to electrically insulate said anode and cathode assemblies relative to said fluid-containing structure and laser tube.

4,481,634

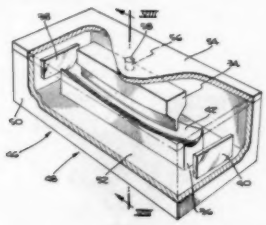
RF EXCITED METAL WAVEGUIDE LASER

Jonathan G. Grossman; Lee W. Casperson, and Oscar M. Stafsudd, Jr., all of Los Angeles, Calif., assignors to The Regents of the University of California, Berkley, Calif.

Filed Apr. 28, 1983, Ser. No. 489,512

Int. Cl.³ H01S *3/097*

U.S. Cl. 372—87 **18 Claims**



1. In an r.f. excited metal waveguide laser having two parallel, opposed, longitudinal electrodes to which r.f. energy is applied to excite the laser, the improvement comprising:

(a) one of the electrodes being concave in the longitudinal direction having a radius of curvature r1 and also being concave in the transverse direction along its entire length with a radius of curvature r2 and,

(b) the other of the electrodes being convex in the longitudinal and transverse directions with corresponding complementary radii of curvature to r1 and r2, respectively, whereby said one electrode also functions as a waveguide for the laser light beam.

4,481,635

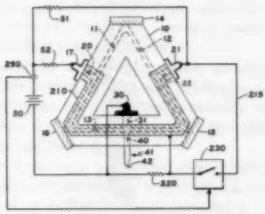
RING LASER START UP APPARATUS

Theodore W. Broberg, New Brighton, and David D. Rathe, Cottage Grove, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 11, 1982, Ser. No. 338,757

Int. Cl.³ H01S *3/083*

U.S. Cl. 372—94 **58 Claims**



1. In a ring laser angular rate sensor wherein a substantially thermally and mechanically stable block provides a plurality of interconnected cavities therein, selected ones of said plurality of interconnected cavities being interconnected to form a closed-loop path to permit light to travel along said closed-loop path, wherein said plurality of interconnected cavities contain an active gas which can freely communicate within said plurality of cavities, wherein said block is defined by outer wall portions and inner wall portions, said inner wall portions being in direct communication with said gas, wherein a portion of a first anode is in communication with said gas in one of said plurality of interconnected cavities, wherein a portion of a first cathode is in communication with said gas in one of said plurality of cavities, said first cathode and said first anode each being electrically connected to at least a first electric potential of sufficient magnitude to establish an electric potential therebetween to at least maintain an electrical current, once established by ionization of said gas, between said first anode and said first cathode through said gas to cause at least two laser beams to travel in opposite directions through said selected ones of said cavities forming said closed-loop path, the improvement comprising

electric field distributing means electrically connected to a selected one of said anode and said cathode providing a second distributed electric field along a portion of a path between said first anode and said first cathode enhancing generation and acceleration of free charges in said gas along a prescribed path between said first cathode and said first anode through said gas which includes a portion of first and second ones of said selected ones of said plurality of interconnected cavities forming said closed-loop path.

4,481,636

ELECTRODE ASSEMBLIES FOR THERMAL PLASMA GENERATING DEVICES

Thomas R. Curr, Johannesburg, and John F. Mooney, Roodepoort, both of South Africa, assignors to Council for Mineral Technology, Randburg, South Africa

Filed Mar. 1, 1983, Ser. No. 471,124

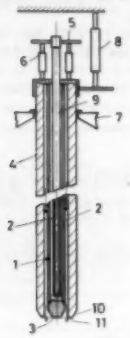
Claims priority, application South Africa, May 5, 1982, 82/3076

Int. Cl.³ H05H *1/26*

U.S. Cl. 373—18 **5 Claims**

1. An electrode assembly for a plasma generating device, the electrode assembly comprising a central water cooled electrode and a sheath held in spaced relationship relative thereto to define therewith a passage for gas along the outside of the

electrode, the electrode assembly being characterized in that the sheath is of a non-water-cooled nature and is made of an



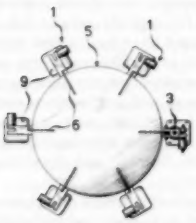
electrically conductive material having a melting point above 2,000° C.

4,481,637

ARRANGEMENT OF ELECTRODE HOLDERS

Knut Evensen, Oslo, Norway, assignor to Elkem a/s, Oslo, Norway

Filed Feb. 4, 1983, Ser. No. 464,117
Claims priority, application Norway, Feb. 12, 1982, 820417
Int. Cl.³ H05B 7/107
U.S. Cl. 373—97 **12 Claims**



1. An electrode feeding assembly for supporting and feeding an electrode in an electrothermic smelting furnace said electrode having a casing with a plurality of horizontally spaced generally vertical ribs projecting outwardly therefrom which comprises:

(a) a plurality of horizontally spaced clamping means which support said electrode by exerting clamping pressure on said ribs in one position to impose substantially only tangential forces on said electrode;

(b) each of said clamping means being individually movable in vertical direction upwardly relative to said electrode;

(c) means for temporarily relaxing the clamping pressure of each individual clamping means to move it in vertical direction upwardly relative to said electrode and into a second position and for restoring the clamping pressure when said clamping means are in the second position; and

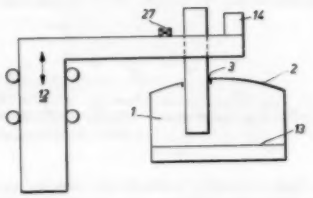
(d) means for individually moving said clamping means in vertical direction upwardly into a second position relative to said electrode while the electrode is supported by a plurality of said individually movable clamping means and for simultaneously moving said electrode and clamping means downwardly to feed the electrode down toward the furnace whereby said clamping means can be moved upwardly one at a time into a second position relative to the electrode and simultaneously moved downwardly to feed the electrode in the furnace.

4,481,638

ELECTRIC ARC FURNACE

Erwin Raquet, Witten, Fed. Rep. of Germany, assignor to Krupp Stahl AG, Bochum, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,823
Int. Cl.³ H05B 7/10
U.S. Cl. 373—98 **17 Claims**



1. An electric arc furnace particularly adapted for melting steel having:

at least one electrode;

a support arm holding said electrode and forming therewith a first oscillating system of a particular system having a particular natural frequency; and

a vibration remover comprising a second oscillation system tuned to said particular natural frequency and coupled to said first oscillating system and comprising a neutral mass and a spring;

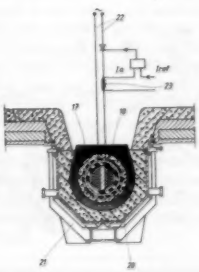
said first and second oscillation systems being coupled whereby the oscillations of both are of opposite phase and act against each other thereby reducing vibrations of said electrode.

4,481,639

METHOD FOR TEMPERATURE CONTROL OF INDUCTORS

Ake Archenholtz, and Kjell Bergman, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Feb. 18, 1983, Ser. No. 467,516
Claims priority, application Sweden, Feb. 23, 1982, 8201122
Int. Cl.³ H05B 5/06
U.S. Cl. 373—150 **13 Claims**



1. A method of controlling the temperature of a metal in a channel of an inductor unit of a channel-type induction furnace which is fed with a constant voltage, comprising measuring the electric current in the inductor unit, comparing the measured electric current with a desired value of electric current which corresponds to the value of the measured electric current at a temperature of the metal in the channel at or near the Curie point of the metal, and controlling the power supplied to the inductor unit, in dependence on said comparison, thereby to control the temperature of the metal in the channel.

4,481,640
SPREAD SPECTRUM MODEM

Sherman M. Chow, Ottawa, and Pok F. Lee, Richmond, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

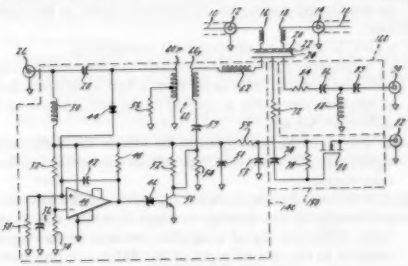
Filed Sep. 23, 1982, Ser. No. 422,466
Claims priority, application Canada, Jun. 30, 1982, 406395
Int. Cl.³ H04K 1/04
U.S. Cl. 375—1 21 Claims

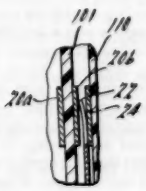
1. A MODEM apparatus comprising:
(a) means for phase shifting input binary pair symbols by π/N, for an N-PSK system, where N is a positive integer,
(b) means for twice differentially phase encoding the phase shifted symbols,
(c) means for phase modulating a subcarrier signal having a frequency much higher than the input binary pair symbols, by the differentially phase encoded symbols, and
(d) means for converting the phase modulated subcarrier signal to a spread spectrum output signal for transmission.

4,481,641
COAXIAL CABLE TAP COUPLER FOR A DATA TRANSCEIVER

Melvin G. Gable, Ypsilanti, Mich., and Richard H. Sherman, Fremont, Calif., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,418
Int. Cl.³ H04B 1/48; H01P 5/12
U.S. Cl. 375—7 7 Claims





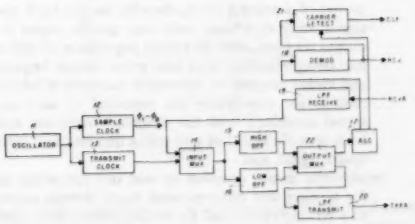
1. A coaxial cable coupler for maintaining a continuous low impedance path for a main coaxial transmission cable and for providing a removable tap connection to said cable comprising:
a housing for electrically shielding a portion of said main coaxial transmission cable and said tap connection;
first and second coaxial connectors on said housing for electrically connecting said housing to a shield conductor of said main coaxial transmission cable and for electrically insulating said housing with respect to a signal carrying center conductor of said main coaxial transmission cable;
means within said housing for providing a low impedance path between the signal carrying center conductor of said first and second coaxial connectors and including a substrate with a first exposed strip conductor electrically connected to said connectors;
means providing an exposed tap strip conductor for mounting within said housing in an opposing position with respect to said first strip conductor;
resilient electrically conducting means mounted between said first strip conductor and said tap strip conductor and being compressed therebetween to provide said tap connection when said tap strip conductor providing means is mounted in said housing; and
said tap strip conductor providing means further includes circuit means for maintaining a high impedance receiving network and a switchable high impedance transmitting network connected to said tap strip conductor.

4. A coupler as in claim 1, wherein said switchable high impedance transmitting network includes a transformer having a primary winding connected to receive periodically transmitted data signals from an associated transmitter via a transmitter output connector on said tap strip connector providing means, and a secondary winding electrically connected between said tap strip connector and a normally open electronic switch to reflect a high impedance to said main transmission cable when no data signals are being transmitted by said associated transmitter means.

4,481,642
INTEGRATED CIRCUIT FSK MODEM

Kerry A. Hanson, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 2, 1981, Ser. No. 269,214
Int. Cl.³ H04L 5/16
U.S. Cl. 375—9 64 Claims

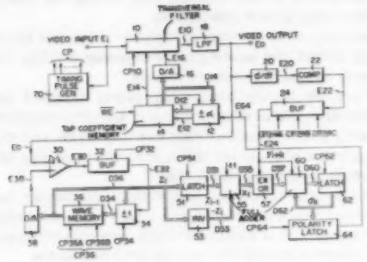


15. An integrated circuit FSK receiver, comprising:
(a) input means for receiving an input FSK signal;
(b) sampled analog bandpass filter means having independently controlled phase response and independently controlled amplitude response, connected to the input means, for receiving the input FSK signal to filter and provide a sine wave output; and
(c) demodulating means connected to the bandpass filter means, to receive the sine wave output for determining whether its frequency corresponds to a mark or a space indication.

4,481,643
AUTOMATIC EQUALIZER

Hiroo Kitazawa, Kumagaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 1, 1982, Ser. No. 394,439
Int. Cl.³ H04B 3/14
U.S. Cl. 375—12 14 Claims



1. An automatic equalizer comprising:

transversal filter means responsive to an input signal and a tap coefficient control signal for equalizing said input signal in accordance with said tap coefficient control signal thereby to provide an equalized output signal, and having an output stage with a delay element through which said equalized output signal passes;

sign means coupled to said transversal filter means and responsive to a clock signal and said equalized output signal from said delay element for generating from said equalized output signal a sign signal according to said clock signal, said sign signal representing the sign of a rate of change of said equalized output signal and including:

means coupled to the output of said delay element for differentiating said equalized output signal to provide a differentiated signal which contains time base information as to specific positions of waveform of said equalized output signal and polarity information thereof, said differentiating means including a buffer circuit having an input terminal for receiving said equalized output signal and an output terminal for providing a specific signal corresponding to said equalized output signal, a reflex line coupled to the output terminal of said buffer circuit for absorbing said specific signal, and for feeding the reflected specific signal back to said output terminal with a given delay time which corresponds to the half period of a writing clock, thereby the fed back specific signal being combined with said specific signal at said output terminal, and the circuit impedance of said reflex line being matched with said given output impedance, and means coupled to the output terminal of said buffer circuit, for converting the potential of said specific signal combined with the absorbed, reflected and fed back specific signal of said reflex line into said differentiated signal, and

read/write means coupled to said differentiating means for writing said differentiated signal therein according to a writing clock, and for reading out written contents thereof as said sign signal according to a reading clock, said writing and reading clocks corresponding to said clock signal;

wave memory means responsive to a timing signal and said equalized output signal from said delay element for storing amplitude information of said equalized output signal according to said timing signal and providing a differentiated wave signal;

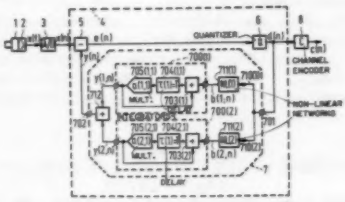
correlator means coupled to said transversal filter means, said sign means, and said wave memory means and responsive to a correlation control signal, said sign signal and said differentiated wave signal, for correlating said sign signal with said differentiated wave signal according to said correlation control signal and providing said tap coefficient control signal; and

generator means coupled to said sign means, said wave memory means, and said correlator means for generating said clock signal, said timing signal, and said correlation control signal, the generation timing of these signals being such that the operation of automatic equalization is regulated.

4,481,644
DIFFERENTIAL PULSE CODE MODULATION TRANSMISSION SYSTEM

Joseph H. Peters, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1982, Ser. No. 434,982
Claims priority, application Netherlands, Nov. 17, 1981, 8105196
Int. Cl.³ H04N 7/12
U.S. Cl. 375—27 2 Claims



1. A differential pulse code modulation (DPCM) transmission system comprising a transmitter and a receiver, wherein:

A. the transmitter comprises:

a.1. means for generating an information signal to be transmitted,

a.2. a DPCM-encoding arrangement comprising:

aa.1. a difference producer to which the information signal to be transmitted is applied via a first input and a first prediction signal via a second input for generating a difference signal;

aa.2. a quantizing arrangement to which the difference signal is applied and which produces a quantized difference signal,

aa.3. a first prediction circuit for generating the first prediction signal and having an input to which the quantized difference signal is applied, as well as an output coupled to the second input of the difference producer;

a.3. a channel-encoding circuit for converting the quantized difference signal into a digital channel signal,

B. the receiver comprises:

b.1. a channel decoding circuit for converting the received digital channel signals into a decoded channel signal,

b.2. A DPCM-decoding arrangement comprising:

bb.1. a summing device to which the decoded channel signal is applied via a first input and the second prediction signal via a second input,

bb.2. a second prediction circuit for generating the second prediction signal and having an input to which the decoded channel signal is applied also having an output coupled to the second input of the summing device;

b.3. means for processing the sum signal produced by the summing device;

C. the first and the second prediction circuits each comprise two or more prediction channels each consisting of a non-linear network followed by a leaky integrator circuit, the input of each non-linear network being connected to the input of the prediction circuit, the integrator circuits all being of the same construction, different sets of weighting factors being associated with each integrator circuit, the output of these integrator circuits being connected to inputs

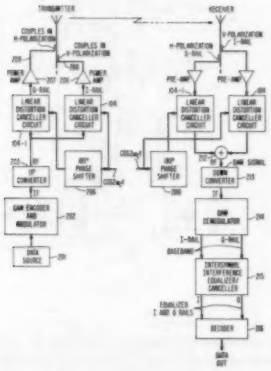
of an adder arrangement whose output is connected to the output of the prediction circuit.

4,481,645

LINEAR DISTORTION CANCELLER CIRCUIT

Peter D. Karabinis, Atkinson, N.H., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1982, Ser. No. 454,266
Int. Cl.³ H04B *15/00*
U.S. Cl. 375—58 **12 Claims**



1. Apparatus for cancelling the linear distortion in a double-sideband, amplitude modulated carrier signal comprising non-zero spectral components in a frequency interval, said apparatus comprising

means for splitting said carrier signal into first and second signals each comprising nonzero spectral components in said frequency interval,

means for multiplying said first signal with a mixing signal at twice the carrier signal frequency to form a product signal comprising nonzero spectral components in said interval, and

means for combining the nonzero spectral components of said product signal and said second signal in said frequency interval.

4,481,646

METHOD AND APPARATUS FOR RECEIVING A DATA SIGNAL MODULATED BY MEANS OF A DOUBLE SIDEBAND-QUADRATURE CARRIER MODULATION TECHNIQUE

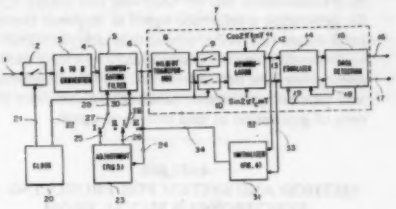
Dominique Godard, LeRouret, France, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 19, 1982, Ser. No. 442,983
Claims priority, application European Pat. Off., Nov. 30, 1981, 81430041.4
Int. Cl.³ H03D *1/24*
U.S. Cl. 375—77 **19 Claims**

1. A method of receiving a data signal sent over a transmission channel by modulating a carrier by means of a DSB-QC modulation technique at a signaling rate of $1/T$, comprising the steps of:

sampling the signal received from said transmission channel, at a rate of $1/\tau$ equal to a multiple of said signaling rate, $1/T$;

filtering the sampled signal such that the phase thereof is not altered and that the components at frequencies f_1 and f_2 of the filtered signal are substantially equal, with said frequencies f_1 and f_2 being defined as



$$f_1 = f_c - \frac{1}{2T} \quad f_2 = f_c + \frac{1}{2T}$$

where f_c is the carrier frequency; and

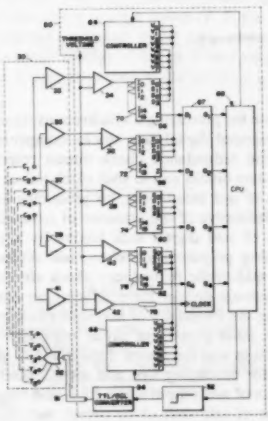
processing said filtered signal to derive the detected data therefrom.

4,481,647

METHOD AND APPARATUS OF COMPENSATING FOR VARIATIONS IN SIGNAL PROPAGATION TIME EXISTING WITHIN THE CHANNELS OF A MULTI-CHANNEL DEVICE

Glenn J. Gombert, Hillsboro, and Steven R. Palmquist, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 6, 1982, Ser. No. 375,506
Claims priority, application Japan, May 15, 1981, 56-73326
Int. Cl.³ H04L *7/04*
U.S. Cl. 375—107 **4 Claims**



1. An input apparatus for compensating for unequal propagation times of a plurality of data transmission lines, said input apparatus comprising:

a reference transmission line;

means for generating a timing signal and for applying said timing signal to the input ends of said data transmission lines and to the input end of said reference transmission line;

variable delay means connected at the output ends of said data transmission lines for receiving said timing signal at differing times as determined by the propagation characteristics of each data transmission line, and for developing a corresponding plurality of time delayed signals in response thereto, each of said time delayed signals being

delayed with respect to its corresponding received timing signal by an appropriate time delay;

reference means connected at the output end of said reference transmission line for receiving said timing signal and for generating a reference signal in response thereto; and

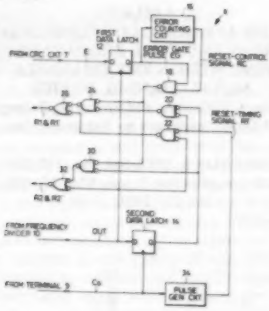
control means responsive to said time delayed signals and to said reference signal for individually adjusting each of said appropriate time delays such that the time of generation of said time delayed signals substantially coincides with the time of generation of said reference signal.

4,481,648

METHOD AND SYSTEM FOR PRODUCING A SYNCHRONOUS SIGNAL FROM CYCLIC-REDUNDANCY-CODED DIGITAL DATA BLOCKS

Yasuhiko Fujii, Yamato, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jul. 14, 1982, Ser. No. 398,141
Claims priority, application Japan, Jul. 17, 1981, 56-111651
Int. Cl.³ H04L *1/08, 7/08*
U.S. Cl. 375—119 **3 Claims**



1. A system for producing a synchronous signal from cyclic-redundancy-coded digital data blocks, comprising:

(a) a cyclic redundancy check circuit responsive to said digital data blocks and to shift clock pulses used for shifting bits of said data blocks, for producing an output error signal indicative of the presence of remainder of division of one of said digital data blocks by a predetermined generating polynominal, where said division is effected within said cyclic redundancy check circuit;

(b) a frequency divider for producing an output signal by dividing the frequency of said shift clock pulses; and

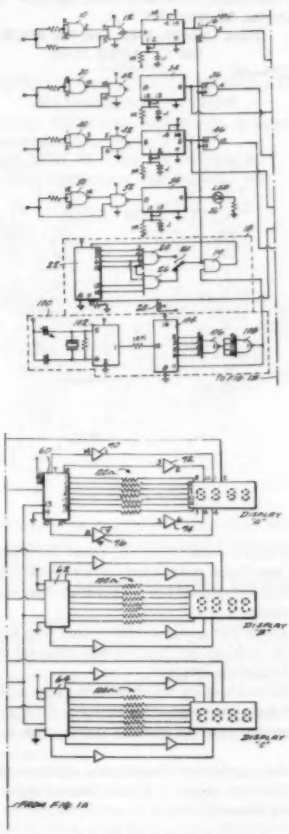
(c) a reset pulse generating circuit responsive to the output signal from said frequency divider and to said shift clock pulses for producing first and second reset pulses in the presence of said output signal from said frequency divider and one of said shift clock pulses, said first and second reset pulses being respectively fed to said cyclic redundancy check circuit and to said frequency divider as initializing signals, said reset pulse generating circuit being further responsive to said error signal for producing, in the presence of said error signal and one of said shift clock pulses, further first and second reset pulses with which said cyclic redundancy check circuit and said frequency divider are initialized again so that initialization is repeatedly effected until said frequency divider is synchronous with the bits of said data blocks where the output signal from said frequency divider can be regarded as said synchronous signal indicative of the boundary between two consecutive data blocks, said reset pulse generating circuit being arranged to produce said first and second reset pulses.

4,481,649

TEST COUNTER

Samuel R. Killen, Rte. 2, Box 238-0, Palmyra, Va. 22962

Filed Mar. 5, 1982, Ser. No. 355,146
Int. Cl.³ H03K *21/18, 21/30*
U.S. Cl. 377—19 **1 Claim**



1. A test counter for testing a pulse producing device comprising:

timer circuit means for defining a predetermined interval of time over which pulses are to be counted;

a pulse counting channel input circuit for receiving pulses from the pulse producing device and processing the received pulses, the pulse counting channel input circuit including

an input terminal,

a first gate having all of its inputs coupled to the input terminal and having an output,

a second gate having a first input coupled to the output of the first gate, a second input coupled to the input terminal and an output, and

a pulse producing circuit, having an input coupled to the output of the second gate, for supplying processed pulses;

means for gating the processed pulses from said pulse producing circuit of said pulse counting channel for the interval of time established by the timer circuit means;

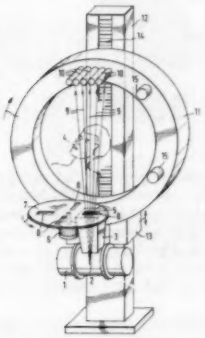
a counter for counting the pulses gated by the pulse counting channel input circuit; and

display means for displaying the count of the counter.

4,481,650
INSTALLATION FOR PRODUCING RADIOGRAPHIC LAYER IMAGES

Ilmari Kinanen, Espoo, Finland, assignor to Instrumentarium Oy, Finland

Filed Apr. 22, 1982, Ser. No. 370,615
Claims priority, application Finland, Apr. 24, 1981, 811281
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—7 **18 Claims**



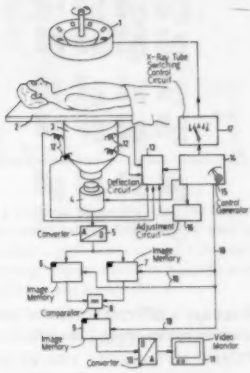
1. Installation for producing radiographic layer images, said installation comprising: penetrating radiation generating means (1, 2), collimating means for collimating and for directing the radiation to an object to be radiographed, detecting means (10) for detecting penetrating radiation passed through the object, and information collecting, storing and processing means connectable to said detecting means (10) for storing and processing the detected information in a form for visualization thereof, said collimating means including a collimation unit (3) having at least two narrow, substantially parallel collimating slots (5) for collimating the radiation to fan-shaped beams, said slots being substantially in alignment with the longitudinal axis of the object so that one dimension of the images to be produced is determined by the length of said slots and, thus, by the width of the fan-shaped beams, said installation further including means (11, 13) for moving said radiation generating means (1, 2) and said collimating slots (5) together with said detecting means (10) around the object in mutual synchronization in a direction at least substantially orthogonal to the collimating slots, said direction defining the other dimension of the images to be produced, so that at least substantially all parts to be visualized in the object are radiated from a plurality of different directions by means of said narrow fan-shaped beams for obtaining information of a number of superimposed image layers, said information collecting, storing and processing means selecting the required layer or layers to be visualized on visualizing means.

4,481,651
X-RAY DIAGNOSTIC INSTALLATION FOR X-RAY TOMOGRAPHIC IMAGES

Joerg Haendle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,284
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1981, 3145438
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—22 **5 Claims**

1. An x-ray diagnostic installation for x-ray tomographic images, comprising a control generator, a number of x-ray sources (1) controlled by the control generator so as to be switched on individually in succession by means of the control generator (14), a patient support (2), an x-ray image intensifier (3) having deflection coils (12), deflection means (13) connected to the deflection coils and controlled by the control generator (14) for effecting synchronous movement of the electron image in the x-ray image intensifier (3), a video camera (4) coupled with the outlet fluorescent screen of the x-ray image intensifier, image storage means (6, 7), and a monitor (11), characterized in that the image storage means (6, 7) are so



designed that at least one of two groups of different individual images, superimposed, respectively, is capable of being stored therein, that the control inputs of the image storage means (6, 7), for the purpose of group-wise storage, are connected with the control generator (14), and that comparator means (8) is associated with the image storage means (6, 7) for comparing mutually corresponding image point data comprising that contained in the image storage means (6, 7) and supplying only those particular image point data to the monitor which are in conformity.

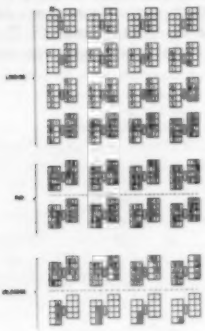
4,481,652
IRRADIATION DEVICE

Jackson A. Ransohoff, Bethesda, Md., assignor to Neutron Products Inc., Dickerson, Md.

Filed Jan. 19, 1981, Ser. No. 225,599
Int. Cl.³ G21K *5/00*
U.S. Cl. 378—69 **11 Claims**

1. An apparatus for the irradiation of materials comprising:
(a) a shielded irradiation chamber containing a source of ionization radiation;
(b) a plurality of carriers for holding material to be irradiated in said chamber;
(c) a plurality of racks, said racks each including means for supporting at least two such carriers in a horizontal arrangement with respect to each other;
(d) means for moving said racks in discrete increments in a direction parallel to the plane of said source on either side of said source in an endless rectangular horizontal path around said source such that the carriers are carried together in ranks of at least two on either side of the source; and
(e) means for changing the horizontal location of said carri-

ers in a direction normal to the plane of the source of radiation during the course of irradiation such that each



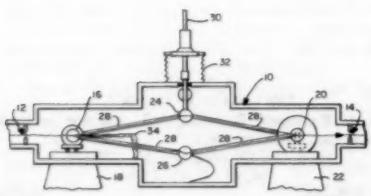
carrier will occupy a different horizontal position in rank during successive cycles around the source of radiation.

4,481,653

TUNABLE X-RAY MONOCHROMATOR USING TRANSMISSION GRATINGS

Roman O. Tatchyn, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Aug. 11, 1982, Ser. No. 407,287
Int. Cl.³ G01N *23/20*
U.S. Cl. 378—85 **7 Claims**



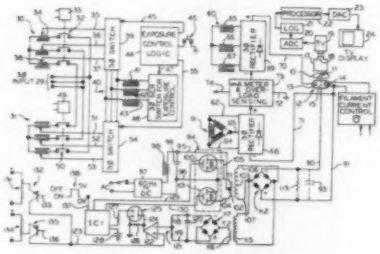
1. An X-ray monochromator comprising
a housing,
a radiation input port to said housing,
a radiation output port from said housing,
an input transmission grating positioned in said housing to receive radiation from said input port,
deflection means within said housing for receiving radiation from said input grating,
an output transmission grating positioned in said housing to receive radiation from said deflection means and direct said radiation to said radiation output port, and
coupling means mechanically and moveably coupling said input grating, said deflection means, and said output grating for tuning said monochromator.

4,481,654

X-RAY TUBE BIAS SUPPLY

Herbert E. Daniels, Brown Deer, and Vern R. Petersen, Brookfield, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 9, 1982, Ser. No. 417,715
Int. Cl.³ H05G *1/30*
U.S. Cl. 378—110 **8 Claims**



1. Apparatus for controlling the bias voltage on the control grid of an X-ray tube in connection with the operation of producing alternating X-ray beams having nominally low and high energies where higher X-ray tube current flows during the low energy beams than during the high energy beams, comprising:
an X-ray tube including an anode, a control grid and an electron emissive filament comprising a cathode,
means for causing a predetermined current flow through the filament to thereby set the temperature and emissivity of the filament,
power supply means for applying alternatingly to said anode the lower of a selected dc kilovoltage and the higher of a selected dc kilovoltage to produce the nominally low and high energy beams, respectively,
inverter means operative to output alternating current (ac) signals having a frequency depending on the frequency of switching signals that are input to said inverter means,
voltage-to-frequency converter means responsive to input of a variable control voltage signal that is proportional to the desired bias voltage by supplying said switching signals to said inverter means at a frequency corresponding to the value of said control voltage signal,
one transformer having a primary winding for being energized with said ac signals and having a secondary winding, said transformer having parasitic capacitance and inductance that results in resonance and maximum voltage output from said secondary winding at one ac signal frequency and results in lower voltage output at frequencies above or below resonant frequency,
rectifier means having input terminals for the ac output of said secondary winding and having negative and positive bias voltage output terminals connected respectively to said control grid and filament, and
means for controlling said power supply means to apply said low kilovoltage to said X-ray tube anode while said ac frequency is zero or away from the resonant frequency so said bias voltage is less negative and tube current is high and to apply said high voltage to said anode while said ac frequency is at or near resonant frequency so the bias voltage is more negative and said X-ray tube current is lower.

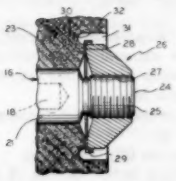
4,481,655
X-RAY TARGET ATTACHMENT

Jeffrey R. Annis, Waukesha, and Srinivasa R. Gowda, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 364,568, Apr. 1, 1982, abandoned. This application Jul. 1, 1982, Ser. No. 394,081

Int. Cl.³ H01J *35/04*

U.S. Cl. 378—125 **15 Claims**



1. An x-ray tube including a rotating anode having an axially extending metal stem, the stem having a threaded end portion and a stop element axially spaced from the end portion, a target disk having a central hole for positioning it on the stem with its rear abutting the stop element and with the threaded portion of the stem accessible from the front of disk, and thermal creep resistant means for clamping the disk on the stem, said means comprising:

a body having a central axially extending hole, the front end of said body having a generally convex shape and the rear end having a generally concave shape, the concavity having an outside diameter less than the outside diameter of said body to thereby define a planar annular land surrounding the concavity and presented toward the rear of the body for transmitting compressive force to the target, the amount of convexity being greater than the amount of concavity such that the axial thickness of the body is greatest in the region surrounding the central hole and said axial thickness decreases radially outwardly from said hole, and means cooperating with the thread on the stem to compress said body axially and predeflect said body to develop a force in it for clamping the target on the stem, the amount of predeflection being sufficient for some deflection and corresponding clamping force to remain and counteract the effect of thread creep resulting from thermal cycling of the target and stem.

4,481,656
MEDICAL APPARATUS

Jozef T. A. Janssen, and Antonius W. M. Schijvens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

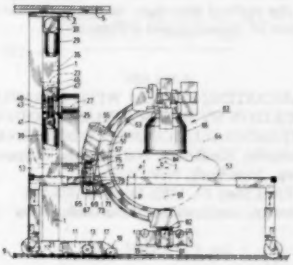
Filed May 4, 1982, Ser. No. 374,805

Claims priority, application Netherlands, May 11, 1981, 8102286

Int. Cl.³ C03B *41/16*

U.S. Cl. 378—196 **4 Claims**

1. A medical apparatus, comprising a vertical column which is displaceable along a horizontal rectilinear displacement path, a support which is slidable along said column in a vertical direction, and an arm which is journalled in said support so as to be rotatable about a first horizontal axis parallel to the displacement path of the column, and is arranged to carry a supporting bearing for an examination device which latter is thereby made rotatable about a second horizontal axis which is parallel to the first horizontal axis, characterized in that the examination device comprises an assembly formed by a radiation source and a radiation detector mounted on a C-shaped frame which latter is displaceably supported by a support bracket which is journalled in said supporting bearing so as to be rotatable about the second horizontal axis, said support bracket including bearing means arranged to engage the C-shaped frame so that the latter is made displaceable circumferentially with respect to the support bracket along a circular displacement path whose median plane extends parallel to both said horizontal axes, said assembly being arranged so that the central ray axis of the examination device lies in a plane which



is spaced from a notional plane defining the adjacent boundary of the C-shaped frame and is parallel to the median plane of the circular displacement path, each of said translatory and rotary displacements being respectively provided by a corresponding individual variable speed motor drive.

4,481,657
PATIENT SUPPORT APPARATUS COMPRISING A ROTATABLE SUPPORT

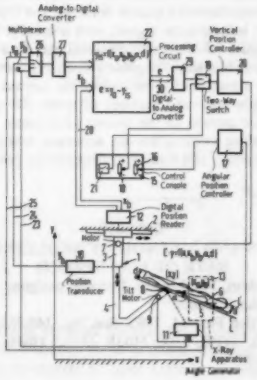
Sten Larsson, Vällingby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 383,983

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1981, 3121728

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—209 **10 Claims**



1. In an x-ray examination system, an x-ray apparatus defining an isocenter, a patient support apparatus comprising a support rotatable about a horizontal spatial axis, for positioning a patient resting on said support, which support is height-, and horizontally adjustable relative to the isocenter of the x-ray apparatus, and motor means for effecting at least the height adjustment, the x-ray apparatus providing reference values representative of the position of the isocenter, the patient support apparatus further comprising one actual value transmitter each for supplying actual coordinate values respectively, representative of the position of the horizontal spatial axis, and an angle function generator for supplying an actual value representative of the tilting of the support, a processing

device receiving the actual values and the reference values and supplying an output as a function of any vertical offset between an examining point at distance d' above the support and the isocenter, and a control coupled with the motor means for the height adjustment, which upon occurrence of a difference between the actual and reference values with respect to the isocenter in the vertical direction, activates the motor means for the purpose of reducing said difference.

4,481,658

FM-BROADCASTING SYSTEM WITH TRANSMITTER IDENTIFICATION BY BINARY PHASE-MODULATED, DIFFERENTIALLY CODED CODE SIGNAL

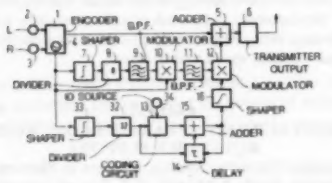
Johan M. Schmidt, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 17, 1982, Ser. No. 378,571

Claims priority, application Netherlands, May 27, 1981, 8102593

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—14 **6 Claims**



1. A FM broadcasting system comprising an FM-transmitter and a receiver cooperating therewith, a transmitter signal comprising a multiplex signal which is frequency-modulated on a main carrier which multiplex signal comprises an audio-frequency information signal, a stereo information signal modulated on a suppressed stereo subcarrier, as well as a stereo pilot whose frequency is situated between the frequency spectra of the two information signals and a binary, differentially coded code signal which is phase-modulated on a code subcarrier situated outside said frequency spectra, characterized in that the code signal had a bit repetition period which is an integral multiple non-zero number of times the period of the stereo pilot, the period of the stereo pilot times said integral number providing control for an accurate, stable time delay source for decoding the binary, differentially coded code signal.

4,481,659

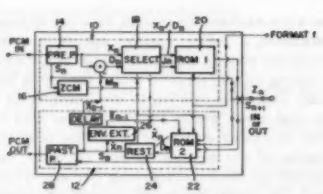
APPARATUS AND METHOD OF REDUCING THE BIT RATE OF PCM SPEECH

Jean-Pierre Adoul, Sherbrooke, Canada, assignor to Universite de Sherbrooke, Canada

Filed Feb. 11, 1982, Ser. No. 348,085

Int. Cl.³ G10L *1/00*; H03K *13/22*; H04B *1/66*

U.S. Cl. 381—31 **13 Claims**



1. In a pulse code modulation (PCM) transmission system for communicating digitized message samples between a transmitting station and a receiving station, said transmitting station including an apparatus for reducing the bit rate of PCM samples from a 8-bit per sample format to a f-bit per sample format, said apparatus comprising:

(a) input means for receiving and breaking down each input PCM sample received to a magnitude X_n, wherein X_n is the absolute value of the sample at time n, and to a sign S_n, wherein S_n is the sign of the sample at time n;

(b) feedback means for transmitting a retrievable sample X_{n-1}, wherein X_n is the magnitude of a retrieved sample at time n;

(c) means for extracting an envelope information from X_n;

(d) means for extracting information relating to a sign change between consecutive samples to provide a zero-crossing signal M_n;

(e) means for computing the difference D_n at time n between X_n and X_{n-1};

(f) selecting means for transmitting

X_n when X_n is in the vicinity of a sign change or for transmitting D_n otherwise; and

a quantizer value reflecting a zero-crossing mode M_n and a signal energy indicated by said envelope extracting means;

(g) first mapping means for establishing a correspondence between X_n or D_n transmitted and a binary word having f−1 number of bits;

(h) second mapping means for providing said retrieved sample X_n or a retrieved difference D from information obtained from said binary word, said format, said zero-crossing signal M_n and said envelope extracting means; and

(i) means combining S_n and X_n to provide an output PCM sample.

4,481,660

APPARATUS FOR DRIVING ONE OR MORE TRANSDUCER UNITS

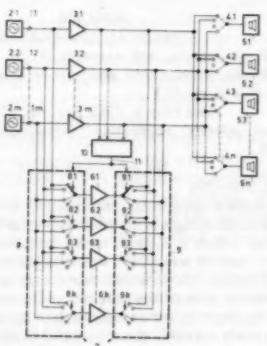
Stephanus H. de Koning, and Willem A. L. Smallenberg, both of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1982, Ser. No. 443,008

Claims priority, application Netherlands, Nov. 27, 1981, 8105371

Int. Cl.³ H03F *21/00*; H04R *29/00*

U.S. Cl. 381—58 **29 Claims**



1. An apparatus for driving n transducer units (n>1) with each transducer unit including one or more electro-acoustic transducers, said apparatus comprising m signal inputs (m≧1) for connecting m signal sources to the apparatus, means connecting each signal input to an input of an associated amplifier unit, n signal outputs to which said n transducer units may be connected, a signal input being connectable to one or more of

the signal outputs via the associated amplifier unit, k auxiliary amplifier units ($k \geq 1$), and switching means for connecting one or more auxiliary amplifier units in parallel with an arbitrary amplifier unit.

4,481,661

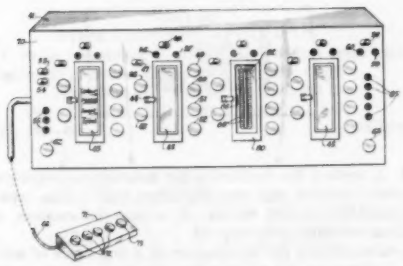
EFFECTS BOX SYSTEM AND METHOD

Abner Spector, 250 174th St. #1904, Miami Beach, Fla. 33160

Continuation-in-part of Ser. No. 150,813, May 19, 1980, Pat. No. 4,388,490. This application Sep. 21, 1982, Ser. No. 420,846

Int. Cl.³ H04R *3/12*

U.S. Cl. 381—61 **8 Claims**



1. An audio signal processing system for allowing the organizing, arranging and rearranging of the number and sequential order of audio effects circuit modules in a main audio path having a source audio signal, by the rapid changing, inserting, and removing of said modules while said system is in operation with the purposeful resultant of any of said module changing operations being an immediate and noiselessly accomplished change in the sound produced by the audio signal flowing through the audio path, while maintaining the continuity of the audio path, said system comprising:

a. a plurality of modules each having module contact elements which include a module input and a module output, each said module output providing audio effects for producing a different sound output;

b. a main housing having a main input and a main output associated with the audio path, and having a plurality of ordered module receiving recesses being serially interconnected between said main input and main output, each said recess having corresponding contact elements for making contact with said module contact elements upon insertion of a module therein;

c. means for routing the source audio signal from said main input through said recess contact elements and said corresponding module contact elements to said module input of a fully-seated module in a lowest ordered recess, thence, serially into and out of each recess having a module fully seated therein, said module output of a module in a highest ordered recess providing essentially the system output signal to the main output;

d. an electronic switch associated with each recess for connecting the audio path to said recess contact elements so that the audio signal flows into and out of said recess through said inserted module only when said module is fully seated wherein solid electronic contact between said module contact elements and recess contact elements is established, and for connecting said audio path to a route bypassing at least one of said recess contact elements when the module is not in said fully-seated position in said recess;

e. means associated with each said recess for detecting if said recess has a module fully seated therein; and

f. means for actuating said electronic switch when said module is moved to or from said fully-seated position in said recess.

4,481,662

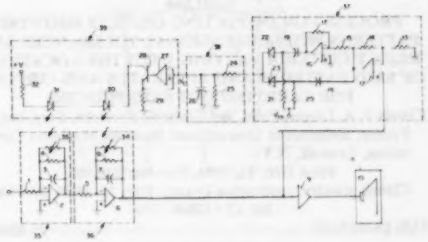
METHOD AND APPARATUS FOR OPERATING A LOUDSPEAKER BELOW RESONANT FREQUENCY

Edward M. Long, 4107 Oakmore Rd., Oakland, Calif. 94602, and Ronald J. Wickersham, 694 Mountain View Ave., Santa Rosa, Calif. 95401

Filed Jan. 7, 1982, Ser. No. 337,787

Int. Cl.³ H03G *5/00*

U.S. Cl. 381—98 **15 Claims**



1. In a loudspeaker system having a resonant frequency F_r, a method for processing an audio signal prior to delivering the signal to the loudspeaker to provide a substantially uniform acoustic output with respect to frequency from said loudspeaker system at frequencies below F_r comprising:

processing said audio signal by changing the strength of said signal at a constant rate in inverse proportion to audio signal frequencies from a frequency F_1 lying below F_r to a frequency F_2 at least one octave above F_r by integrating said audio signal twice.

4,481,663

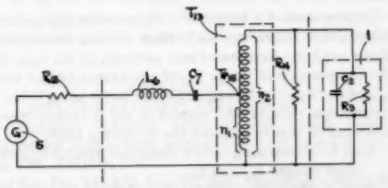
NETWORK FOR USE WITH PIEZOCERAMIC TRANSDUCER

Paul B. Spranger, Fullerton, Calif., assignor to Altec Corporation, Anaheim, Calif.

Continuation of Ser. No. 196,037, Oct. 10, 1980, abandoned. This application May 16, 1983, Ser. No. 494,137

Int. Cl.³ H04R *3/00*

U.S. Cl. 381—98 **13 Claims**



1. An electrical network for coupling an electrical source of audio frequency energy to an acoustic transducer, said transducer having an electrical input impedance over a frequency range which is approximately equivalent to the impedance of the parallel combination of a transducer capacitor and a transducer resistor, comprising:

a truncated filter circuit having an input and an output, with its input connected to the electrical source of audio frequency energy and its output connected to said transducer, said truncated filter circuit comprising at least a first filter branch having filter elements connected between said input and output and a second filter branch having autotransformer output means connected to the output of said first filter branch and connected across said transducer,

said truncated filter circuit cooperating with said transducer capacitor to operate as a bandpass filter having a design impedance, whereby said autotransformer output means and said transducer capacitor provide an impedance equivalent

to the impedance provided by a parallel combination of an output capacitor and an output inductor of any bandpass filter having such a parallel combination of said output capacitor and said output inductor in the output stage of said bandpass filter,

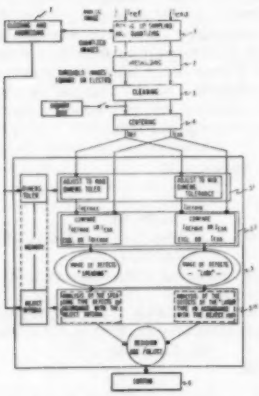
said truncated filter circuit further cooperating with said acoustic transducer to operate as the combination of a bandpass filter having two or more poles and an acoustic transducer.

4,481,664

PROCESS FOR INSPECTING OBJECTS SHOWING PATTERNS WITH DIMENSIONAL TOLERANCES AND REJECT CRITERIA VARYING WITH THE LOCATIONS OF SAID PATTERNS AND APPARATUS AND CIRCUITS FOR CARRYING OUT SAID PROCESS

Claude J. A. Linger, Paris, and Giséle C. Locicero, Evry, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,892
Claims priority, application France, Dec. 18, 1980, 80 430030
Int. Cl.³ G06K *9/00*
U.S. Cl. 382—8 **25 Claims**



1. A process for inspecting objects showing patterns with dimensional tolerances and reject criteria varying in accordance with the location of said patterns, of the type including the comparision of image I_{ref} of a reference object with image I_{exa} of an object to be inspected, the latter being liable to show geometrical defects with respect to the reference object, characterized in that in includes the following steps;

Step 1—elaborating binary electronic images I_{REF} and I_{EXA} from images I_{ref} and I_{exa},

Step 2—defining a structuring element B for each image point (pixel) the size of said structuring element being able to vary for each pixel in function of predetermined data and adjusting I_{REF} to the maximum and minimum dimensional tolerances by expanding and eroding said image by structuring element B, which provides $(I_{REF})_{max}$ and $(I_{REF})_{min}$,

Step 3—forming images of the "spreading" and "lack" type defects by respectively carrying out the following logical operations:

$$[(I_{REF})_{max} \text{ OR } I_{EXA}] \text{ EXCL. OR } (I_{REF})_{max} \text{ and}$$

$$[(I_{REF})_{min} \text{ OR } I_{EXA}] \text{ EXCL. OR } I_{EXA} \text{ and}$$

Step 4—measuring the size of the defects on the defect images and comparing said defects with respect to reject criteria which define, for each pixel, the dimensions of the defects which can be accepted according to predetermined data.

4,481,665

CHARACTER SEGMENTATION METHOD

Naoki Ota, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 16, 1981, Ser. No. 331,310
Claims priority, application Japan, Dec. 17, 1980, 55-178423
Int. Cl.³ G06K *9/16*
U.S. Cl. 382—48 **6 Claims**

1. A method for facilitating the automatic recognition of optically scanned and read characters from within separate sequentially scanned blocks of written information, said method comprising the steps of:

predetermining the classification of a first block of written information and a next successive block of written information of said separate sequentially scanned blocks according to the types of information contained therein;

optically and sequentially scanning said separate blocks of information and generating a representative output signal for each of said characters;

retrievally storing said output signals;

reading each of the stored output signals in the order scanned and determining the end of said first block of information and the beginning of said next successive block of information;

classifying each of the read output signals of said first block in accordance with the predetermined classification of said first block; and

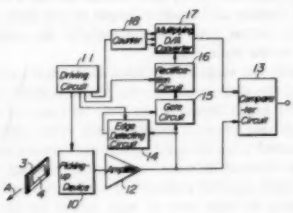
processing the output signals of said first block by a character recognition circuit for identifying the characters within said first block.

4,481,666

READING-OUT APPARATUS

Hideaki Niwa, Hino, Japan, assignor to Kowa Company, Ltd., Nagoya, Japan

Filed Dec. 18, 1981, Ser. No. 332,213
Int. Cl.³ G06K *9/38*; H04N *1/40*
U.S. Cl. 382—53 **17 Claims**



1. An apparatus for reading-out features such as characters and marks, comprising

picking-up means for generating a video signal by scanning an object having the features to be read out;

background level detecting means for exclusively detecting

a background level corresponding to a background of the object from the video signal supplied fom said picking-up means;

control means comprising a slice level setting circuit for adjusting the span and pitch of a plurality of slice levels according to said background level; and

a comparator circuit for generating an output video signal by comparing the video signal supplied from said picking-up means with said slice levels.

4,481,667

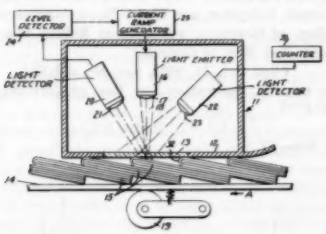
ITEM COUNTING APPARATUS

Earl T. Price, and Arthur F. Allison, both of San Jose, Calif., assignors to Autronics Corporation, Arcadia, Calif.

Filed Dec. 21, 1981, Ser. No. 332,663

Int. Cl.³ G06K *7/10, 9/20;* **G06M** *7/00, 7/06*

U.S. Cl. 382—65 **9 Claims**



1. A system for detecting items moving in a path past a sensing station, said items having surfaces of varying radiant energy reflecting characteristics, comprising;

a radiant energy emitting device for projecting a beam of radiant energy towards said path and onto each of said items that said items pass said station,

a first radiant energy sensing device directed towards said sensing station and effective to receive radiant energy reflected from said beam by said items,

said first sensing device being effective to produce an output signal having an amplitude proportional to the amount of radiant energy reflecteed thereto by said items,

a second radiant energy sensing device directed towards said sensing station and effective to receive radiant energy reflected from said beam by the surfaces of said items and to produce an output signal upon passage of an edge of each of said items past said station,

a signal utilization device controlled solely by said second sensing device upon producing a said output signal above a predetermined level,

means for periodically energizing said emitting device through successive periods of energization, said energizing means comprising means for energizing said emitting device at a constantly varying level of energization during each said period, and

control means responsive to said first sensing device for controlling said last mentioned means during each of said periods to vary the amount of said radiant energy emitted device in a manner to maintain the radiant energy reflected to said second sensing device substantially independent of the reflectivity characteristics of said items,

the amount of said energy reflected from said surfaces to said second sensing device being insufficient to cause said second sensing device to control said signal utilization device.

4,481,668

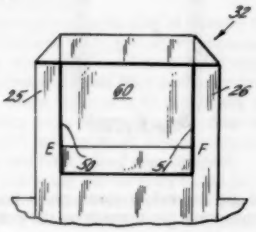
SHOPPING BAG HANDLE AND METHOD OF MANUFACTURE THEREOF

Paul D. Hammacher, Stamford, Conn., assignor to Champion International Corporation, Stamford, Conn.

Filed May 6, 1983, Ser. No. 492,338

Int. Cl.³ B65D *33/07*

U.S. Cl. 383—7 **18 Claims**



1. The method of making a handle for a paper shopping bag panel, said method comprising the steps of:

forming first and second increased thickness strips in said panel which are parallel to one another and which are spaced from one another by a given dimension and which extend parallel to the longitudinal direction in which said handle extends;

forming first and second parallel and coextensive longitudinal slits in said panel which are parallel to and extend along respective ones of the facing longitudinal edges of said first and second increased thickness strips; one end of each of said first and second slits beginning at first and second points respectively which are removed from an end of said panel to define a web extending across one end of said panel; the opposite end of each of said first and second slits terminating at third and fourth points which are contained within the bottom of the handle opening to be formed;

forming a third slit in said panel which extends perpendicularly between said first and second slits to define a flap which extends from said web which extends across the top of said panel;

and thereafter wrapping and securing said flap around said web to define an enlarged thickness carrying handle bounded at its sides by said increased thickness strips in said panel with a hand opening defined beneath said web.

4,481,669

MULTI-WALLED PLASTICS BAG

Francesco Pezzana, Pregnana Milanese, and Cesare Quacquarella, Milan, both of Italy, assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Division of Ser. No. 185,833, Sep. 11, 1980, abandoned, which is a division of Ser. No. 052,171, Jun. 26, 1979, Pat. No. 4,273,549. This application Oct. 13, 1981, Ser. No. 310,586

Claims priority, application United Kingdom, Jun. 26, 1978, 7827884

Int. Cl.³ B65D *30/08*

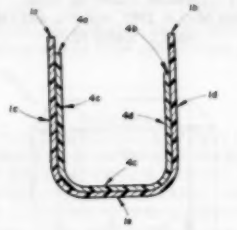
U.S. Cl. 383—94 **8 Claims**

1. A side-sealed flexible plastic bag having first and second sides of substantially equal depth comprising:

a mouth defining portion having a periphery and a depth wherein the entirety of said mouth defining portion consists of a single ply of a gas impervious plastic barrier film and the depth of said mouth defining portion of said first side is different from the depth of said mouth defining portion of said second side;

a multi-ply product enclosing portion comprising said ply of gas impervious plastic barrier film and a plastic strength enhancing ply superimposed upon said plastic gas impervious ply at an interface;

a bottom defining portion comprising substantially registered fold lines of said gas impervious plastic barrier film and said plastic strength enhancing ply; and



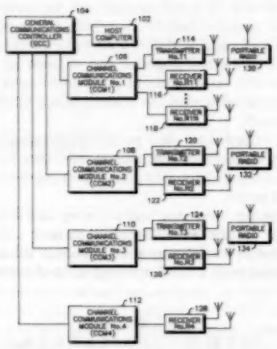
wherein said gas impervious plastic ply is bonded to said strength enhancing ply throughout the entirety of said interface.

4,481,670

METHOD AND APPARATUS FOR DYNAMICALLY SELECTING TRANSMITTERS FOR COMMUNICATIONS BETWEEN A PRIMARY STATION AND REMOTE STATIONS OF A DATA COMMUNICATIONS SYSTEM

Thomas A. Freeburg, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 12, 1982, Ser. No. 441,327
Int. Cl.³ H04B 7/00, 1/00
U.S. Cl. 455—33 **35 Claims**



1. A method for use in a primary station of a communications system for communicating message signals via a communications medium between the primary station and a plurality of remote stations located anywhere in a geographical area that is divided into a plurality of zones, said primary station including control means, a plurality of transmitting means for transmitting message signals modulated on a first carrier signal and a plurality of receiving means for receiving message signals modulated on a second carrier signal, each zone covered by one of the transmitting means and covered by at least one receiving means, and said remote stations including transmitting means for transmitting message signals modulated on the second carrier signal and receiving means for receiving message signals modulated on the first carrier signal; said method for selecting one of the primary station transmitting means for transmitting message signals to a selected remote station, said method comprising the steps of:

(a) measuring the signal strength of the carrier signal received by each primary station receiving means during each transmission from the selected remote station;

(b) computing an adjusted signal strength for each zone by adjusting the measured signal strength for each primary station receiving means by corresponding predetermined factors associated with the zone and combining the adjusted signal strengths; and

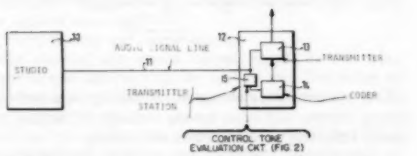
(c) selecting the primary station transmitting means covering the zone which had the largest adjusted signal strength for the last transmission from the selected remote station.

4,481,671

REMOTE CONTROL SYSTEM, PARTICULARLY FOR REMOTE RADIO TRANSMITTER CONTROL

Uwe Mätzold, Salzgitter, and Dieter Heiss, Hildesheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 21, 1982, Ser. No. 435,685
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1981, 3144973
Int. Cl.³ H04B 1/02
U.S. Cl. 455—92 **17 Claims**



1. Remote control system producing an output signal by selection and demodulating a control signal from a mixture of low-frequency signals within the audio range,

in which the control signal is formed by a composite signal comprising a carrier tone frequency (2,350 Hz) within the middle audio range and having a modulating frequency (100–200 Hz) of a frequency in the low audio range, and substantially less than said middle audio range, frequency modulated thereon,

said system comprising

a control signal selection and evaluation circuit including

a band pass filter (1) receiving the mixture of signals, said band pass filter being tuned to pass the frequency modulated carrier frequency (2,350 Hz);

a frequency demodulator (2) receiving the filtered, frequency modulated carrier frequency and demodulating the carrier frequency to deliver the modulating frequency (100–200 Hz);

a selection filter (3) tuned to select the modulating frequency;

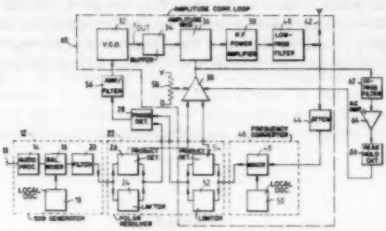
a rectifier (4) rectifying the modulating frequency and

a timing circuit (5) connected to receive the rectified modulating frequency and to produce an output signal if, and only if, the rectified modulating frequency signal persists uninterruptedly for a predetermined time duration to prevent spurious generation of output signals due to random occurrence of signals with audio frequency of approximately the carrier frequency within the mixture of low-frequency signals in the audio range.

4,481,672
POLAR LOOP TRANSMITTER

Stephen W. Watkinson, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,212
Claims priority, application United Kingdom, Mar. 26, 1982, 8208912
Int. Cl.³ H04B 1/04
U.S. Cl. 455—108 11 Claims

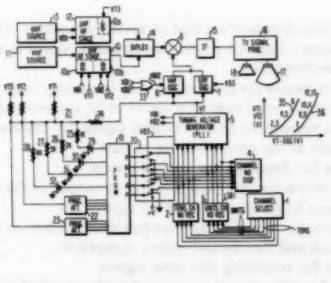


1. A polar loop transmitter comprising in combination:
(a) a source of carrier waves,
(b) an amplitude modulator responsive to said carrier wave source for modulating an incoming signal onto a carrier wave to provide a transmitter output signal,
(c) a differential amplifier for supplying said incoming signal to the amplitude modulator, said differential amplifier having a first input, a second input, an output coupled to said amplitude modulator and a bias control voltage input,
(d) first means responsive to an input signal for providing a first signal related to the envelope of said input signal to said first input,
(e) second means responsive to said output signal for providing a second signal related to the envelope of said output signal to said second input, and
(f) a negative feedback bias adjusting system for said differential amplifier varying the bias control voltage thereof connected between the output and bias control voltage input of the differential amplifier.

4,481,673
RF PROM TRACKING FOR TUNERS

Max W. Muterspaugh, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,447
Int. Cl.³ H04B 1/26
U.S. Cl. 455—180 12 Claims



1. In a tuning system for a receiver including an RF filter means for selecting RF signal corresponding to respective selected channels in response to a filter tuning control signal, a local oscillator for developing a local oscillator signal and controlling its frequency in response to an oscillator tuning control signal, channel selection means for generating binary coded signals representing channel numbers of selected channels, local oscillator control means for generating said oscillator control signal in response to said binary coded channel number representative signals and a mixer for heterodyning said selected RF signal with said oscillator signal for frequency translating said selected RF signal to a predetermined intermediate frequency (IF); means for generating said filter tuning control signal comprising:

memory means having a plurality of memory locations with unique addresses, each memory location storing and developing, when addressed, binary coded signals representing a component of said filter tuning control signal;

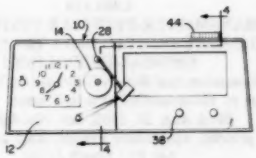
combining means responsive to said binary coded signals representing said component of said filter tuning control signal and to said oscillator tuning control signal for developing said filter tuning control signal;

means for addressing said memory locations in response to said channel number representative binary signals including coupling means for supplying only preselected ones of said channel number representative binary coded signals to address inputs of said memory means, said coupling means selectively increasing the numbers of least significant bits of said binary coded channel number representative signals not coupled to said address inputs as said channel numbers increase.

4,481,674
SLEEP SWITCH VOLUME CONTROL

Wayne A. Silva, 97 Park St., New Bedford, Mass. 02740

Filed Jun. 30, 1982, Ser. No. 393,773
Int. Cl.³ H04B 1/08, 1/16
U.S. Cl. 455—231 7 Claims



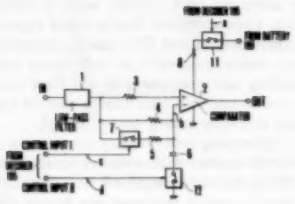
1. A clock radio comprising a timer assembly, a primary volume control assembly, a secondary volume control assembly, a support surface and rotation means, the primary volume control assembly including a primary variable resistor and a first volume control knob, the secondary volume control assembly including a secondary variable resistor and a second volume control knob, the timer assembly comprises a rotatable member having a cylindrical body portion and a support member, the rotatable member and the support member extending away from the support surface, the body portion including an external surface having electrically conductive first and second portions formed on two longitudinal, circumferential sections of the body portion, the first and second electrically conductive portions electrically insulated from each other, an electrical conductor extending from the support member, the electrical conductor having a central portion bearing against the second electrically conductive portion and the rotatable member adapted to be rotated through a timing cycle by the rotation means, the primary variable resistor electrically connected to the second conductive portion and the secondary variable resistor electrically connected to the first conductive portion whereby the electrical conductor bears against the first electrically conductive portion during a portion of the timing cycle.

4,481,675

PULSE DETECTING CIRCUIT OF RECEIVER FOR USE IN DIGITAL RADIO COMMUNICATION SYSTEM

Yoshio Ichikawa, and Shinjiro Umetsu, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,632
Claims priority, application Japan, Jan. 26, 1981, 56-9991
Int. Cl.[3] H04B *1/16*
U.S. Cl. 455—343 9 Claims



1. A pulse detecting circuit of a receiver for use in a digital radio communication system in which a power supply means for said receiver is periodically ON-OFF controlled by a control means, said pulse detecting circuit comprising:

a first means including a capacitor having a first and second terminal for integrating an input signal received by said receiver;

a second means for detecting pulses in said input signal by utilizing an output of said first means as a reference voltage; and

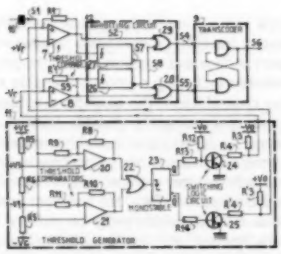
a third means coupled to said first means for holding constant the output of said first means every time said source of power supply means is in an OFF state.

4,481,676

TRANSMITTER-RECEIVER SYSTEM FOR VARIABLE-RATE DIGITAL DATA TRANSMISSION VIA OPTICAL-FIBER LINKS

Grégoire Eumurian, and Robert Gadrault, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 23, 1982, Ser. No. 410,707
Claims priority, application France, Aug. 21, 1981, 81 16121
Int. Cl.[3] H04B *12/00*
U.S. Cl. 455—608 8 Claims



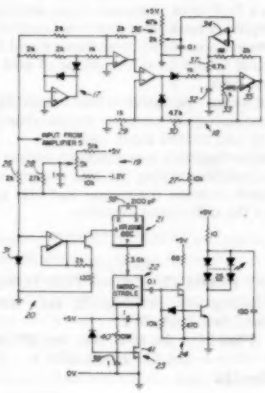
1. A transmitter-receiver system for variable-rate digital data transmission via optical-fiber links, comprising; an optical transmitter for producing light pulses corresponding to three-level internal coding having a constant direct-current component of the information and also involving periodic emission of a so-called refreshment pulse when the coded signal remains unchanged during a predetermined period; an optical fiber conductor for directing the light pulses to an optical receiver which includes a photodetector stage followed by a transimpedance circuit said transimpedance circuit connected to a capacitive coupling having an output, said output supplying two comparators having symmetrical thresholds and a threshold generator for automatically switching said thresholds among a plurality of predetermined discrete values as a function of the amplitude of the signal; and a transcoding circuit supplied from the comparison outputs, wherein said receiver further comprises means for guarding against the parasitic effects of changes of state resulting from overoscillation, said means being constituted by an inhibiting circuit which is interposed between the comparators and the transcoding circuit and which inhibits said transcoding circuit as a result of each internal-code pulse detected by the comparators, inhibition being produced during a time interval so determined as to cover all possible rebounds which may follow the pulse.

4,481,677

OPTICAL TRANSMITTING AND RECEIVING APPARATUS

Yuan-Lu Li, Ottawa, and Leslie J. Crane, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jan. 31, 1983, Ser. No. 462,566
Int. Cl.[3] H04B *9/00*
U.S. Cl. 455—617 10 Claims



1. Optical transmitting and receiving apparatus comprising:

oscillator means for producing an output signal at a controllable frequency;

control means for controlling said frequency in dependence upon the amplitude of a signal to be transmitted;

means responsive to said output signal for emitting optical pulses at the controlled frequency;

means for detecting the optical pulses;

filter means for low-pass filtering an output of the detecting means to produce a received signal;

wherein the signal to be transmitted comprises an a.c. input signal and the control means comprises:

means for rectifying the input signal;

peak-detecting means responsive to the rectified input signal to produce a d.c. signal in dependence upon the peak amplitude of the rectified input signal; and

summing means for summing the d.c. signal and the input signal to produce a unipolar signal for controlling said frequency.

4,481,678

SIGNAL RECEIVING CIRCUIT FOR OPTICAL COMMUNICATION

Fukuma Sakamoto, and Shizuo Izumida, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Inc., Osaka, Japan

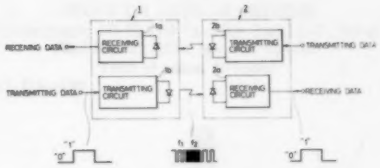
Filed Aug. 4, 1982, Ser. No. 405,066

Claims priority, application Japan, Aug. 6, 1981, 56-123207

Int. Cl.[3] **H04B** *9/00*

U.S. Cl. 455—619 **5 Claims**

1. A signal receiving circuit for optical data communication for preventing false signals during periods when no data is being transmitted comprising a light receiving element adapted to receive a data signal, an amplifier, a demodulator connected to an output of said amplifier, a signal source of a specific frequency, an attenuator having an input connected to said signal source for attenuating the amplitude of the specific frequency signal from said signal source to a value less than that of said data signal, and an addition circuit having one input from said light receiving element and a second input from said attenuator and connected to an input of said amplifier, said



addition circuit superposing on a data signal received by said light receiving element said attenuated signal.

DESIGNS

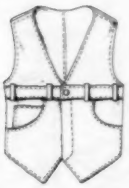
NOVEMBER 6, 1984

276,189
VEST

Derryl Kostynuik, 21 Whitaker Bay N.E., Calgary, Alberta, Canada

Filed Apr. 6, 1982, Ser. No. 366,016
Claims priority, application Canada, Dec. 11, 1981, 11-12-81-6
Term of patent 14 years

U.S. Cl. D2—190



276,190
SHOE

Robert Hess, 1810 Washington St., New Holstein, Wis. 53601

Filed Oct. 13, 1981, Ser. No. 310,884
Term of patent 14 years

U.S. Cl. D2—309

276,191
BELT

David Engelson, Roslyn, N.Y., assignor to Page Accessories, Inc., West Babylon, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,593
Term of patent 14 years

U.S. Cl. D2—387

276,192
BRUSH OR SIMILAR ARTICLE

Normajean Fusco, 445 E. 77th St., New York, N.Y. 10021

Filed Sep. 27, 1982, Ser. No. 424,033
Term of patent 14 years

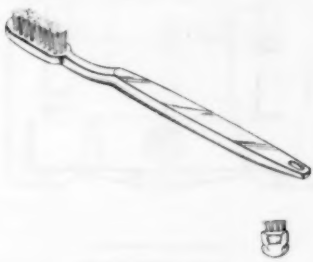
U.S. Cl. D4—120

276,193
TOOTHBRUSH

Hiroki Tanabe, Kanagawa; Hidetake Tobe, and Akimoto Honda, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 413,985
Term of patent 14 years

U.S. Cl. D4—104

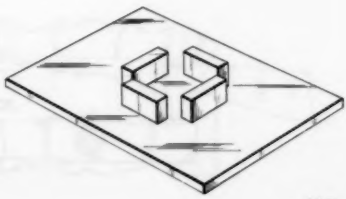


276,194
VIDEO GAME CONTROL HOLDER

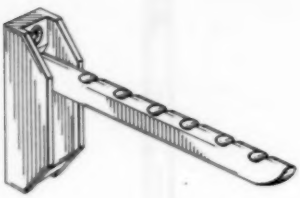
Kevin M. Schuster, 11662 Lampson Ave., Garden Grove, Calif. 92640

Filed Nov. 27, 1981, Ser. No. 325,099
Term of patent 14 years

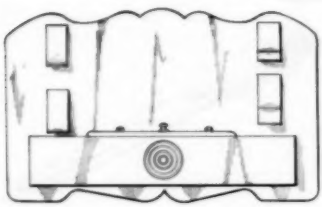
U.S. Cl. D6—512



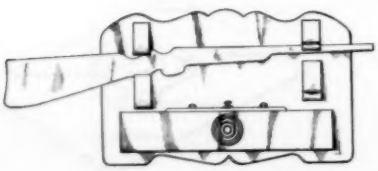
276,195
WALL MOUNTABLE COLLAPSIBLE RACK
John N. Smith, Tempe, Ariz., assignor to Warren F. B. Lindsley, Phoenix, Ariz., a part interest
Filed Apr. 26, 1982, Ser. No. 371,653
The portion of the term of this patent subsequent to Nov. 29, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—324



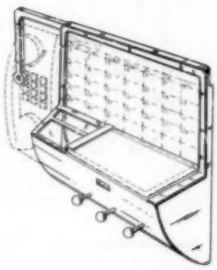
276,196
GUN RACK
John B. Padgett, Box 91, Stockton, Ala. 36579
Division of Ser. No. 317,526, Nov. 2, 1981,. This application Nov. 18, 1983, Ser. No. 553,303
Term of patent 14 years
U.S. Cl. D3—38



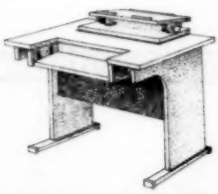
276,197
GUN RACK
John B. Padgett, Box 91, Stockton, Ala. 36579
Division of Ser. No. 317,526, Nov. 2, 1981,. This application Nov. 18, 1983, Ser. No. 553,304
Term of patent 14 years
U.S. Cl. D3—38



276,198
RACK FOR A WALL-MOUNTED TELEPHONE
Yaffa Licari, Elberon, N.J., assignor to Basic Line, Inc., Cliffwood Beach, N.J.
Filed Jan. 15, 1982, Ser. No. 339,492
Term of patent 14 years
U.S. Cl. D6—555



276,199
WORK DESK FOR A WORD PROCESSOR UNIT
Alfred Kwiecinski, and Jon A. Yauger, both of Fairfield, Ohio, assignors to Hamilton Sorter Co., Inc., Fairfield, Ohio
Filed Mar. 8, 1982, Ser. No. 356,243
Term of patent 14 years
U.S. Cl. D6—420



276,200
WINE GLASS

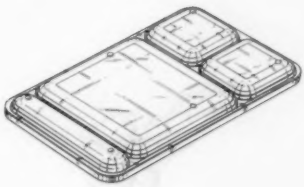
Ben Seibel, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.

Filed Jul. 29, 1982, Ser. No. 402,943
Term of patent 14 years
U.S. Cl. D7—13

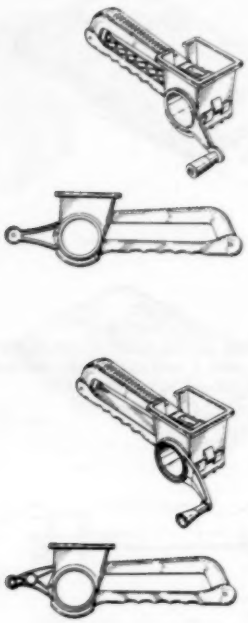
276,201
SERVING TRAY OR THE LIKE

Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.

Filed Jan. 12, 1982, Ser. No. 338,949
Term of patent 14 years
U.S. Cl. D7—38



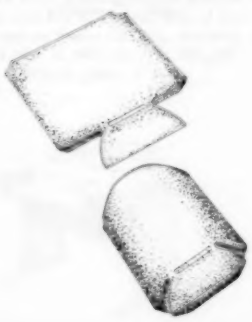
276,202
FOOD GRATER, SLICER, GRINDER OR SIMILAR ARTICLE
So Shun, Kowloon, Hong Kong, assignor to Ki Mee Metal & Plastic Factory Ltd., Hong Kong, Hong Kong
Continuation-in-part of Ser. No. 351,933, Feb. 24, 1982, abandoned. This application Feb. 15, 1983, Ser. No. 466,506
Claims priority, application United Kingdom, Oct. 26, 1981, 1003203; Aug. 19, 1982, 1008350
Term of patent 14 years
U.S. Cl. D7—47



276,203
COLLAPSIBLE INSULATING CONTAINER
David I. Heweston, 163 Crown St., East Sydney, New South Wales, 2010, Australia
Filed Aug. 16, 1982, Ser. No. 408,645
Term of patent 14 years
U.S. Cl. D7—70

276,204
COLLAPSIBLE INSULATING CONTAINER
David I. Heweston, 163 Crown St., East Sydney, New South Wales, 2010, Australia
Filed Aug. 16, 1982, Ser. No. 408,646
Term of patent 14 years
U.S. Cl. D7—70

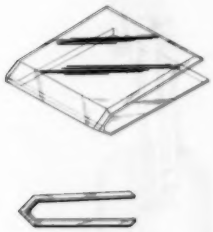
276,205
COLLAPSIBLE INSULATING CONTAINER
David I. Heweston, 163 Crown St., East Sydney, New South Wales, 2010, Australia
Filed Aug. 16, 1982, Ser. No. 408,648
Term of patent 14 years
U.S. Cl. D7—70



276,206
NAPKIN CLIP

William J. Williams, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.

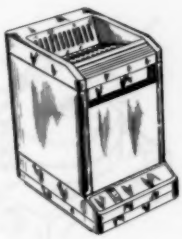
Filed Jun. 25, 1982, Ser. No. 392,280
Term of patent 14 years
U.S. Cl. D7—72

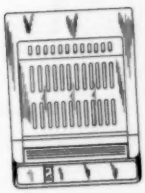


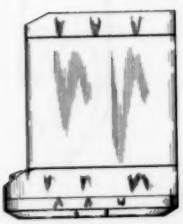
276,207
TOASTER

Jan F. Van Asten, Leek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

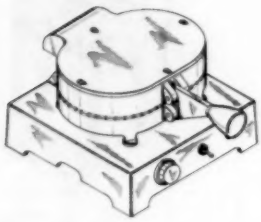
Filed Jun. 1, 1982, Ser. No. 383,846
Claims priority, application Benelux, Dec. 11, 1981, 56375-01
Term of patent 14 years
U.S. Cl. D7—328

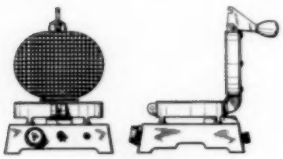






276,208
ELECTRIC BAKER FOR AN ICE CREAM CONE OR SIMILAR ARTICLE
Anthony R. LaDuca, Wayne, and S. David Kaplan, Fair Lawn, both of N.J., assignors to Royal Copenhagen Cone Company, Inc., Pompton Plains, N.J.
Filed May 10, 1982, Ser. No. 376,928
Term of patent 14 years
U.S. Cl. D7—352



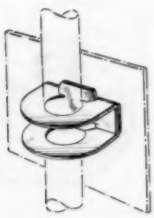


276,209
EVISCERATOR TOOL
Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, Netherlands
Filed Jun. 7, 1982, Ser. No. 385,675
Term of patent 14 years
U.S. Cl. D7—368

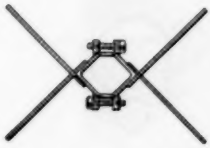
276,210
LID REMOVING TOOL
Billy F. Masten, 5865 Willowbrook, Norman, Okla. 73069, and Warren D. Bass, 1800 Terryton Dr., Norman, Okla. 73071
Filed Aug. 30, 1982, Ser. No. 412,595
Term of patent 14 years
U.S. Cl. D8—40

276,211
TOOL BIT HOLDER
Peter Lee, Central, Hong Kong, assignor to Arrow Trading Co., Inc., New York, N.Y.
Filed Jun. 22, 1982, Ser. No. 390,974
Claims priority, application United Kingdom, Apr. 1, 1982, 1005948
Term of patent 14 years
U.S. Cl. D8—83

276,212
MOUNTING CLIP
Jesus R. Villanueva, 8015 Marion Dr., Justice, Ill. 60458
Filed Jul. 20, 1982, Ser. No. 400,102
Term of patent 14 years
U.S. Cl. D8—373



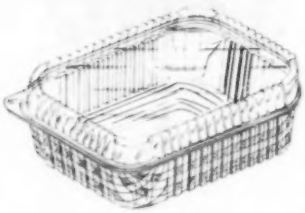
276,213
POST ANCHOR
A. Philip Parduhn, Oklahoma City, Okla., assignor to VePed Traffic Controls, Inc., Oklahoma City, Okla.
Filed Aug. 23, 1982, Ser. No. 410,747
Term of patent 14 years
U.S. Cl. D8—373



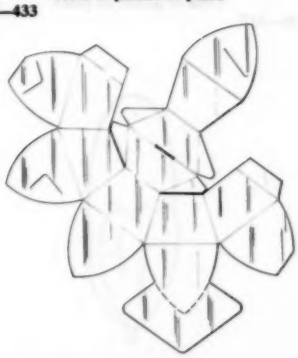
276,214
COMBINED TOILETRY CONTAINER AND DISPENSER
Alec Fry, Box 241, Rte. 1, Eagleville, Tenn. 37060
Filed Aug. 17, 1982, Ser. No. 408,823
Term of patent 14 years
U.S. Cl. D9—315

276,215
PACKAGING CONTAINER FOR A RACKET STRING
Chao-Ren Wang, No. 334, Chung-Mei Rd., Sec. 6, Homei Chen, Changhua Hsien, Taiwan
Filed Jul. 13, 1981, Ser. No. 282,250
Claims priority, application Taiwan, Jun. 26, 1981, 7031735
Term of patent 14 years
U.S. Cl. D9—415

276,216
STACKABLE PACKAGING CONTAINER
John T. Michaud, Moraga, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Dec. 18, 1981, Ser. No. 332,281
Term of patent 14 years
U.S. Cl. D9—425



276,217
CARTON BLANK
John J. Austin, Jr., Elkhart, Ind., assignor to Champion International Corporation, Stamford, Conn.
Filed Nov. 12, 1982, Ser. No. 442,466
Term of patent 14 years
U.S. Cl. D9—433



276,218
SEAL FOR A CONTAINER CAP OR OUTLET PORT
Brian E. Baldwin, Englewood, and James D. Styers, Littleton, both of Colo., assignors to Baxa Corporation, Denver, Colo.
Filed Dec. 3, 1981, Ser. No. 327,023
Term of patent 14 years
U.S. Cl. D9—499

276,219
KITCHEN TIMER
Dana W. Mox, Elk Grove Village, Ill., assignor to Tricolor Corporation, Las Cruces, N. Mex.
Filed May 26, 1982, Ser. No. 382,244
Term of patent 14 years
U.S. Cl. D10—40

276,220

COMBINED COMPUTERIZED TIME RECORDER AND AUTOMATIC PAYROLL PROCESSOR

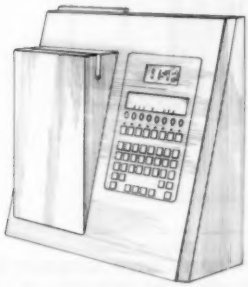
Alan G. Witts, and Philip St. C. Wilshire, both of Dorset, England, assignors to Custom Microdesign Limited, Dorset, England

Filed Apr. 7, 1982, Ser. No. 366,339

Claims priority, application United Kingdom, Oct. 7, 1981, 1002886

Term of patent 14 years

U.S. Cl. D10—41



276,221

BRACELET

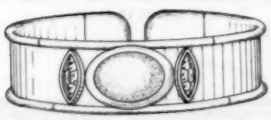
Marina Bulgari, Athens, Greece, assignor to Marina B Creation Societe Anonyme, Vaduz, Liechtenstein

Filed Dec. 30, 1981, Ser. No. 335,748

Claims priority, application Italy, Jul. 2, 1981, 35896/81[U]

Term of patent 14 years

U.S. Cl. D11—3



276,222

TENNIS SCOREKEEPER BANNER

Joseph C. Eliot, 919 Cedar Grove Rd., Broomall, Pa. 19008

Filed Feb. 17, 1982, Ser. No. 349,637

Term of patent 14 years

U.S. Cl. D11—165

276,223

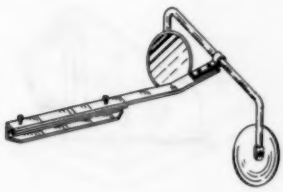
FORWARD VIEWING VEHICLE MIRROR

Raymond L. Kallmyer, 4124 Victoria Dr., Fort Wayne, Ind. 46815

Filed Oct. 28, 1982, Ser. No. 437,452

Term of patent 14 years

U.S. Cl. D12—189



276,224

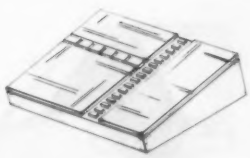
ELECTRONIC CONSOLE FOR THE REMOTE CONTROL OF BURGULAR, SMOKE ALARMS AND THE LIKE

John W. Goodin, Long Beach, and Charlie A. Patterson, Costa Mesa, both of Calif., assignors to Dart Industries Inc., Northbrook, Ill.

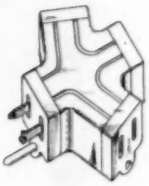
Filed Jun. 2, 1982, Ser. No. 384,314

Term of patent 14 years

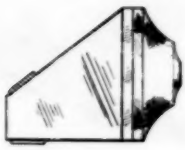
U.S. Cl. D13—12



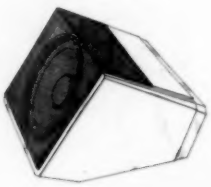
276,225
ELECTRICAL CONNECTOR
Michael W. H. Powel, Poulsbo, Wash., assignor to Powel and Associates, Inc., Poulsbo, Wash.
Filed Jun. 14, 1982, Ser. No. 388,449
Term of patent 14 years
U.S. Cl. D13—29



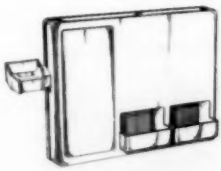
276,226
LOUD SPEAKER ENCLOSURE
Luis Del Rosario, 5524 San Fernando Rd., Glendale, Calif. 91203
Filed Feb. 8, 1982, Ser. No. 356,135
Term of patent 14 years
U.S. Cl. D14—33



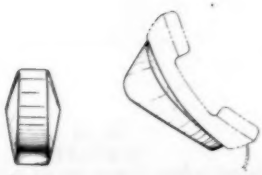
276,227
LOUDSPEAKER
Hitoshi Nakamura, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 17, 1982, Ser. No. 379,193
Claims priority, application Japan, Jan. 22, 1982, 57-2236
Term of patent 14 years
U.S. Cl. D14—33



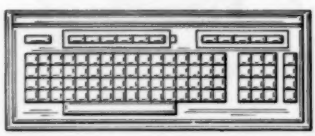
276,228
HOUSING FOR A WALL TELEPHONE STAND
Keith D. Bartley, Indianapolis, Ind.; Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa.; Craig F. Sampson, Indianapolis, Ind., and Michael P. Zambelli, Maplewood, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jan. 5, 1983, Ser. No. 455,887
Term of patent 14 years
U.S. Cl. D14—60



276,229
TELEPHONE SHOULDER REST
Sanford J. Heilner, Salt Lake City, Utah, assignor to Boyer Products, Inc., Salt Lake City, Utah
Filed Feb. 8, 1982, Ser. No. 347,003
Term of patent 14 years
U.S. Cl. D14—65

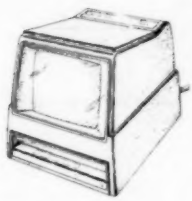


276,230
COMPUTER KEYBOARD
Kunio Akiyama, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 30, 1982, Ser. No. 412,813
Claims priority, application Japan, Mar. 3, 1982, 57-8901
Term of patent 14 years
U.S. Cl. D14—100



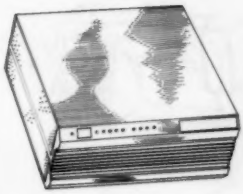
276,231
WORD PROCESSOR
Charles R. Frigard, Deephaven; Verne L. Severson, Minneapolis; Thomas N. Ursin, Minneapolis; Virgil A. Kluesner, Minneapolis, and Fredric C. Zimmerman, Minneapolis, all of Minn., assignors to Wordtronix Inc., Minneapolis, Minn.
Filed Oct. 19, 1981, Ser. No. 312,919
Term of patent 14 years
U.S. Cl. D14—106

276,232
VIDEO TERMINAL WITH A HIDEAWAY KEYBOARD
Willard A. Dix, Noblesville, Ind.; Gordon E. Sylvester, Jamaica, N.Y., and Joe E. Warren, Indianapolis, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jan. 11, 1982, Ser. No. 338,329
Term of patent 14 years
U.S. Cl. D14—106

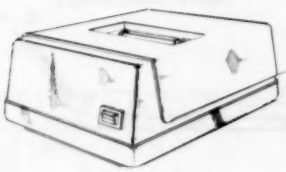


276,233
FRONT PORTION OF A COMPUTER
Donald P. DeVale, Sycamore; Howard B. Wilbrandt, Crystal Lake; Dennis E. Tomlinson, and Leonard J. Kubacki, both of St. Charles, all of Ill., assignors to Industrial Design Electronic Associates, Inc., Sycamore, Ill.
Filed Nov. 9, 1981, Ser. No. 319,212
Term of patent 14 years
U.S. Cl. D14—106

276,234
LOCAL AREA COMPUTER NETWORK INTERFACE HOUSING
John D. Banks, Sutton, and Joseph G. St. Onge, Newbury, both of Mass., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Mar. 29, 1982, Ser. No. 363,089
Term of patent 14 years
U.S. Cl. D14—107

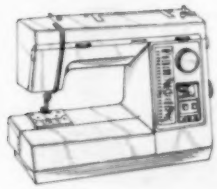


276,235
PRINTER TERMINAL CONSOLE
Jaime E. Dorman, 4190 Olympic Way, and A. Jack Miller, 4437 Adonis Dr., both of Salt Lake City, Utah 84117
Filed Oct. 20, 1980, Ser. No. 198,791
Term of patent 14 years
U.S. Cl. D14—111



276,236
COMPUTER DISPLAY
Kunio Akiyama, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 30, 1982, Ser. No. 412,946
Claims priority, application Japan, Mar. 3, 1982, 57-8903
Term of patent 14 years
U.S. Cl. D14—113

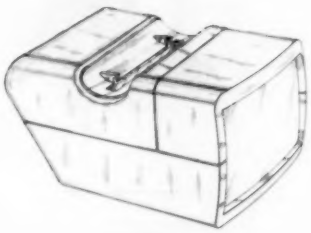
276,237
SEWING MACHINE
Yoshihide Yoneda, 7-401, 53, Taguchiyama 1-chome, Hirakata-shi, Osaka, Japan
Filed Dec. 21, 1981, Ser. No. 333,187
Claims priority, application Japan, Dec. 9, 1981, 56/54389
Term of patent 14 years
U.S. Cl. D15—70



276,238
DOCUMENT FEEDER FOR COPYING MACHINE
Mikio Kosako; Shigeaki Hayashi, and Harumi Sakamoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 18, 1982, Ser. No. 390,036
Claims priority, application Japan, Dec. 29, 1981, 56-57945
Term of patent 14 years
U.S. Cl. D16—32

276,239
REFLECTING MIRROR PHOTO TITLER APPARATUS
George M. Yamamoto, 4650 Proctor Rd., Castro Valley, Calif. 94546
Filed Oct. 29, 1982, Ser. No. 437,807
Term of patent 14 years
U.S. Cl. D16—38

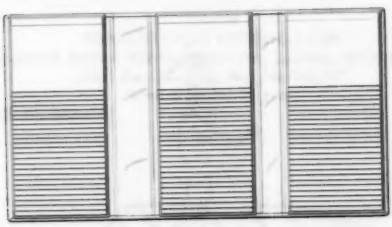
276,240
SLIDE VIEWER
Francis Bonnefoy, Fontainebleau, France, assignor to Posso S.A., France
Filed Jul. 20, 1982, Ser. No. 400,130
Claims priority, application Hague, Jan. 21, 1982, DM/001149
Term of patent 14 years
U.S. Cl. D16—17



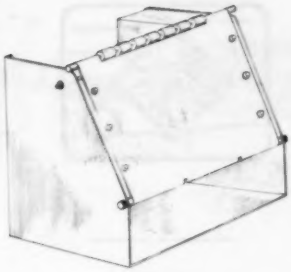
276,241
FILM PROCESSOR
Jerry A. Caflisch, Minneapolis; Conrad E. Lee, Golden Valley, and Larry I. Bass, New Hope, all of Minn., assignors to Pako Corporation, Minneapolis, Minn.
Filed Jun. 1, 1982, Ser. No. 383,824
Term of patent 14 years
U.S. Cl. D16—34

276,242
ELECTRONIC CALCULATOR
Harumi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 29, 1982, Ser. No. 344,743
Claims priority, application Japan, Jul. 30, 1981, 56-33816
Term of patent 14 years
U.S. Cl. D18—7

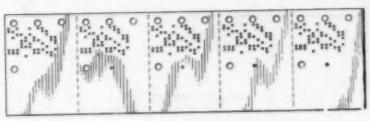
276,243
PORTFOLIO TYPE PHOTOGRAPHIC ALBUM
Michael N. Brucoli, Stamford, Conn., assignor to The Holson Company, Wilton, Conn.
Filed Jun. 18, 1982, Ser. No. 389,754
Term of patent 14 years
U.S. Cl. D19—26



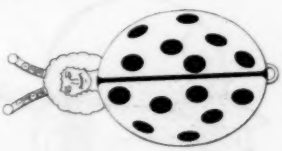
276,244
PAPER MOVING AND DISPLAY UNIT FOR FANFOLDED COMPUTER PRINTOUT PAPER
Stuart Abseck, Transmatic, Inc., Box 186, Roxbury, Conn. 06783
Filed Jun. 16, 1982, Ser. No. 388,916
Term of patent 14 years
U.S. Cl. D19—91



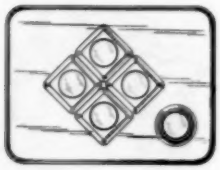
276,245
PRICE TAG BLANK
Lars Larsson, Spånga, Sweden, assignor to C. Erling Persson, London, England
Filed Mar. 23, 1982, Ser. No. 361,072
Claims priority, application Sweden, Sep. 25, 1981, 81-2101
Term of patent 14 years
U.S. Cl. D20—27



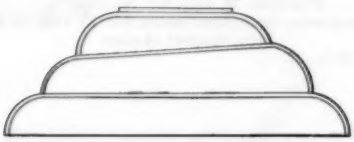
276,246
LOTTERY NUMBER SHAKER
Eric von Lienen, 32615 Florence, Garden City, Mich. 48135
Filed Jul. 29, 1982, Ser. No. 403,009
Term of patent 14 years
U.S. Cl. D21—39



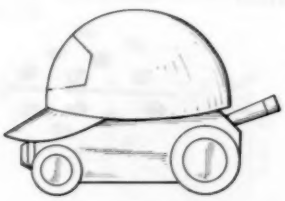
276,247
CURSOR CONTROL
Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.
Filed Jun. 14, 1982, Ser. No. 387,827
Term of patent 14 years
U.S. Cl. D21—48



276,248
NOVELTY TOY MOLD
Robert A. Gauldin, 909 E. Okla., Enid, Okla. 73701
Filed Oct. 5, 1981, Ser. No. 308,082
Term of patent 14 years
U.S. Cl. D21—59

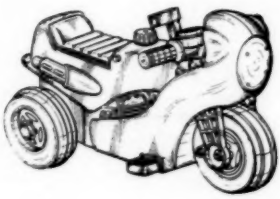


276,249
SIMULATIVE TOY CAR
Katsushi Murakami, Tokyo, Japan, assignor to Mameet Co., Ltd., Tokyo, Japan
Filed Jan. 22, 1982, Ser. No. 341,792
Claims priority, application Japan, Aug. 1, 1981, 56-34176
Term of patent 14 years
U.S. Cl. D21—128



276,250
SIMULATIVE TOY CAR
Katsushi Murakami, Tokyo, Japan, assignor to Mameet Co., Ltd., Tokyo, Japan
Filed Jan. 25, 1982, Ser. No. 342,665
Claims priority, application Japan, Aug. 1, 1981, 56-34179
Term of patent 14 years
U.S. Cl. D21—128

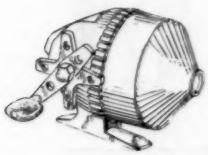
276,251
TOY MOTORCYCLE
Kazuo Wakimura, Tokyo, Japan, assignor to Mitsuwa Kogyo Co., Ltd., Tokyo, Japan
Filed Jan. 15, 1982, Ser. No. 339,822
Term of patent 14 years
U.S. Cl. D21—134



276,252
TOY ANIMAL
Kouichi Urabe, Tokyo, Japan, assignor to Tomy Kogyo Company, Inc., Japan
Filed Jul. 15, 1982, Ser. No. 398,572
Term of patent 14 years
U.S. Cl. D21—164

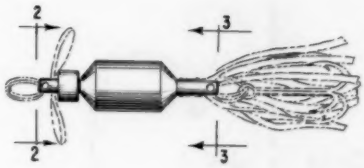
276,253
INSECT LURE
Daniel M. Stout, Kirkwood, Mo., assignor to Whitmier Research Laboratories, St. Louis, Mo.
Division of Ser. No. 274,549, Jun. 17, 1981, Pat. No. Des. 271,231. This application Mar. 11, 1983, Ser. No. 474,524
Term of patent 14 years
U.S. Cl. D22—19

276,254
FISHING REEL
Richard J. Robbins, Derby, Kans., assignor to Brunswick Corporation, Skokie, Ill.
Filed Oct. 25, 1982, Ser. No. 435,146
Term of patent 14 years
U.S. Cl. D22—25

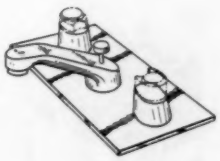


276,255
TRANSLUCENT FISHING LURE
Robert M. Scriver, 622 Hamilton Ave., Lansing, Mich. 48901
Filed Jan. 25, 1982, Ser. No. 342,377
Term of patent 14 years
U.S. Cl. D22—27

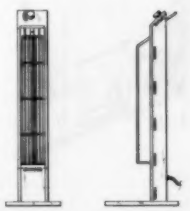
276,256
FISHING LURE
Vitervo Leal, 4744 N. Whipple, Chicago, Ill. 60625
Filed Sep. 28, 1982, Ser. No. 426,212
Term of patent 14 years
U.S. Cl. D22—27



276,257
FAUCET
Wolfgang Fabian, Mannheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 92,874, Nov. 9, 1979,. This application May 14, 1982, Ser. No. 378,361
Term of patent 14 years
U.S. Cl. D23—25



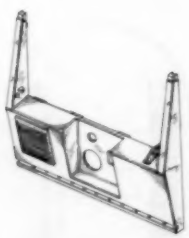
276,258
QUARTZ HEATER
Dov Z. Glucksman, Newton Centre, Mass., assignor to Boston Manufacturing Company, Boston, Mass.
Filed Feb. 22, 1982, Ser. No. 351,297
Term of patent 14 years
U.S. Cl. D23—123



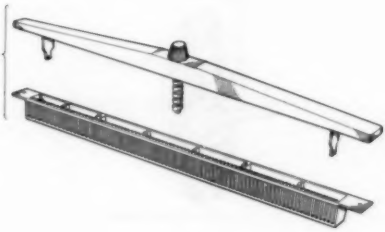
276,259
BAR SINK FAUCET
Charles D. Miller, Kansas City, Mo., assignor to Broadway Industries, Inc., Kansas City, Mo.
Filed May 28, 1982, Ser. No. 382,923
Term of patent 14 years
U.S. Cl. D23—25

276,260
WICK HEATER
Robert F. Shaftner, and Michael A. Kagan, both of Bowling Green, Ky., assignors to Koehring Company, Brookfield, Wis.
Filed Jun. 21, 1982, Ser. No. 391,955
Term of patent 14 years
U.S. Cl. D23—123

276,261
FRONT PANEL FOR A WICK HEATER
Robert F. Shaftner, Bowling Green, Ky., assignor to Koehring Company, Brookfield, Wis.
Filed Jun. 21, 1982, Ser. No. 390,677
Term of patent 14 years
U.S. Cl. D23—128

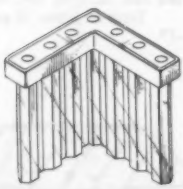


276,262
AIR INTAKE ASSEMBLY
Gösta Nilsson, Box 7, S-360 32 Gemla, and Hans Lundin, Gyllenhammars v. 24B, S-302 41 Halmstad, both of Sweden
Filed Dec. 4, 1981, Ser. No. 327,468
Claims priority, application Sweden, Jun. 11, 1981, 81-1352
Term of patent 14 years
U.S. Cl. D23—151

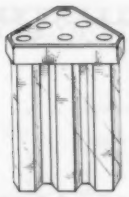


276,263
AIR CIRCULATOR
Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064
Filed Sep. 30, 1982, Ser. No. 431,794
Term of patent 14 years
U.S. Cl. D23—151

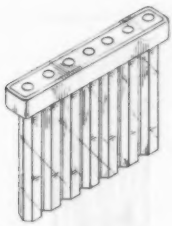
276,264
FETAL LUNG MATURATION TESTER
Michael J. Boris, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 12, 1982, Ser. No. 367,301
Term of patent 14 years
U.S. Cl. D24—8



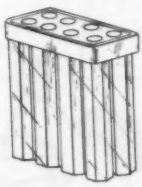
276,265
FETAL LUNG MATURATION TESTER
Michael J. Boris, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 12, 1982, Ser. No. 367,302
Term of patent 14 years
U.S. Cl. D24—8



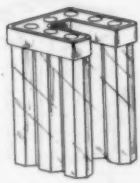
276,266
FETAL LUNG MATURATION TESTER
Michael J. Boris, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 12, 1982, Ser. No. 367,303
Term of patent 14 years
U.S. Cl. D24—8



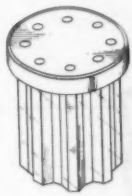
276,267
FETAL LUNG MATURATION TESTER
Michael J. Boris, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 12, 1982, Ser. No. 367,304
Term of patent 14 years
U.S. Cl. D24—8



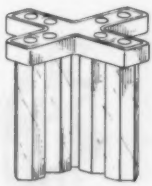
276,268
FETAL LUNG MATURATION TESTER
Michael J. Boris, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 12, 1982, Ser. No. 367,305
Term of patent 14 years
U.S. Cl. D24—8



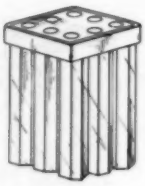
276,269
FETAL LUNG MATURATION TESTER
Michael J. Boris, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 12, 1982, Ser. No. 367,311
Term of patent 14 years
U.S. Cl. D24—8



276,270
FETAL LUNG MATURATION TESTED
Michael J. Boris, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 12, 1982, Ser. No. 367,312
Term of patent 14 years
U.S. Cl. D24—8



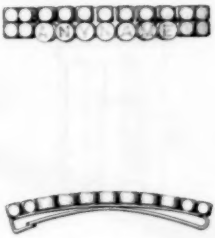
276,271
FETAL LUNG MATURATION TESTER
Michael J. Boris, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 12, 1982, Ser. No. 367,313
Term of patent 14 years
U.S. Cl. D24—8



276,272
COMBINED FINGER CLIP AND CUP HOLDER FOR DENTAL CLEANING PASTE OR THE LIKE
Edward A. Weissenburger, Mercerville, N.J., assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Jun. 14, 1982, Ser. No. 378,296
Term of patent 14 years
U.S. Cl. D24—10

276,273
ROOF TILE
Joseph W. Shaw, 10000 Valleydale SE., Magnolia, Ohio 44643
Filed Aug. 16, 1982, Ser. No. 408,610
Term of patent 14 years
U.S. Cl. D25—95

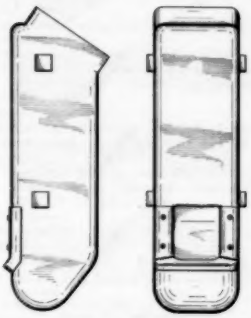
276,274
BEADED BARRETTE OR SIMILAR ARTICLE
Roni Bezanson, and Joanne Kane, both of Sharon, Mass., assignors to The Merit Company, Park Ridge, Ill.
Filed Aug. 2, 1982, Ser. No. 404,528
Term of patent 14 years
U.S. Cl. D28—42



276,275
DRY SHAVER
Petrus Jacobus J. Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 9, 1982, Ser. No. 367,129
Claims priority, application Benelux, Oct. 20, 1981, 56187-00
Term of patent 14 years
U.S. Cl. D28—49

276,276
PEDICURE INSTRUMENT
Jack D. Bankier, 1724 Longvalley Dr., Northbrook, Ill. 60062
Filed Jan. 11, 1982, Ser. No. 338,602
Term of patent 14 years
U.S. Cl. D28—59

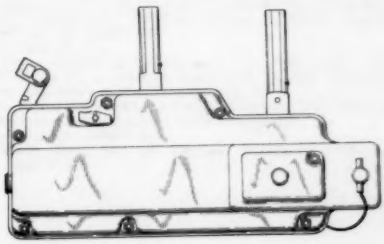
276,277
FEEDER
Bjarne J. Bore, Kleppe, Norway
Filed Sep. 28, 1982, Ser. No. 425,860
Claims priority, application Norway, Apr. 1, 1982, 62806
Term of patent 14 years
U.S. Cl. D30—15



276,278
TETHERING DEVICE
James F. Curtin, 16044 E. Queenside Dr., Covina, Calif. 91722
Filed Aug. 24, 1981, Ser. No. 295,864
Term of patent 14 years
U.S. Cl. D30—44

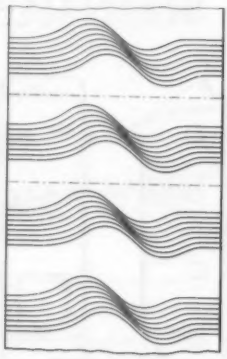
276,279
ELECTRIC VACUUM CLEANER
Jonathan Miller, Williamsport; Rudolph W. Wacek, Montoursville, and Robert C. Berfield, Jersey Shore, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Sep. 27, 1982, Ser. No. 424,596
Term of patent 14 years
U.S. Cl. D32—22

276,280
CABLE TRACTION APPARATUS
Francois Quirin, Courbevoie, France, assignor to Tractel S.A., France
Filed Nov. 12, 1981, Ser. No. 320,369
Claims priority, application France, Jul. 16, 1981, 812503
Term of patent 14 years
U.S. Cl. D34—33

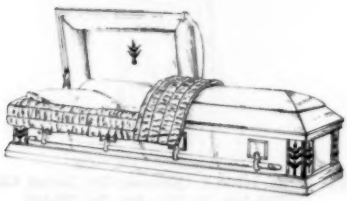


276,281
BASKET
Per-Olof Landgren, Nacka, Sweden, assignor to Attention Team No. 1 AB, Sundbyberg, Sweden
Filed Jun. 1, 1982, Ser. No. 383,876
Claims priority, application Sweden, Dec. 1, 1981, 81-2819
Term of patent years
U.S. Cl. D34—44

276,282
CONTINUOUS SHEET MATERIAL OR THE LIKE
Klaus Burg, Teaneck, N.J., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 195,555, Oct. 9, 1980, abandoned. This application May 24, 1982, Ser. No. 381,119
Term of patent 14 years
U.S. Cl. D59—2B



276,283
BURIAL CASKET
Michael L. Beardsley, Chittenango, N.Y., assignor to Marsellus Casket Co., Inc., Syracuse, N.Y.
Filed Jun. 14, 1982, Ser. No. 388,362
Term of patent 14 years
U.S. Cl. D99—7



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF NOVEMBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.A.R.C. (Management) Pty. Limited: *See—*
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A & B Industries, Inc.: *See—*
Atkins, John H., Sr., 4,480,776, Cl. 224-243.000.

A-Betong AB: *See—*
Thomsen, Ove; and Ronnow, Peter, 4,481,293, Cl. 435-167.000.

A G Motor Corp.: *See—*
Ezell, James J.; and Garin, Paul V., III, 4,480,867, Cl. 296-65.00R.

AB Hagglund & Soner: *See—*
Ingvast, Hakan; and Karlsson, Bo, 4,480,723, Cl. 188-62.000.

Abbott, Randle L., to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft. Continuously variable transmission mechanism. 4,481,004, Cl. 474-28.000.

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Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,480,619, Cl. 123-446.000.

Abe, Shinya: *See—*
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,481,217, Cl. 424-311.000.

Able, Edward T.: *See—*
Krieger, Raymond L.; Volna, Steven J.; and Able, Edward T., 4,480,700, Cl. 173-145.000.

Abt, Edgar J., to Motorola, Inc. Relative velocity sensor for void sensing fuzes and the like. 4,480,550, Cl. 102-215.000.

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Gilmore, William J., 4,480,494, Cl. 74-473.0SW.

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Lukawich, Joseph J.; and Adams, Kenneth D., 4,480,566, Cl. 112-321.000.

Adams, Victor J.; and Polka, Frank, to Motorola, Inc. Collet and method for dispensing viscous materials. 4,480,983, Cl. 425-467.000.

Adeka Argus Chemical Co., Ltd.: *See—*
Nakahara, Yutaka; Haruna, Tohru; and Tobita, Etsuo, 4,481,317, Cl. 524-119.000.

Adoul, Jean-Pierre, to Universite de Sherbrooke. Apparatus and method of reducing the bit rate of PCM speech. 4,481,659, Cl. 381-31.000.

Adur, Ashok M.: *See—*
Shida, Mitsuzo; Zeitlin, Robert; Machonis, John, Jr.; and Adur, Ashok M., 4,481,262, Cl. 428-441.000.

Advanced Imaging Devices, Inc.: *See—*
Goldberg, Paul R., 4,481,542, Cl. 358-331.000.

Advanced Micro Devices, Inc.: *See—*
Thomas, Mammen; and Koyama, Linda J., 4,481,070, Cl. 156-643.000.

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Witherell, James L.; and Tibbet, Michael D., 4,480,999, Cl. 434-18.000.

AEL Microtel, Ltd.: *See—*
Huntley, Christopher R., 4,481,490, Cl. 332-41.000.

Aeroquip Corporation: *See—*
Graves, Robert W., 4,480,857, Cl. 285-45.000.
Holmes, Paul M., 4,480,530, Cl. 92-78.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Muller, Jurgen, 4,480,423, Cl. 53-266.00R.
Osegowitsch, Viktor; and Leuchter, Jurgen, 4,480,901, Cl. 354-320.000.
Wagensonner, Eduard; Krekeler, Ulrich; and Ruf, Wolfgang, 4,481,530, Cl. 358-44.000.

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Muylle, Wilfried E., 4,480,742, Cl. 198-689.000.
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Coe, Charles G.; and Kuznicki, Steven M., 4,481,018, Cl. 55-68.000.
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Ishikawa, Norikatsu; and Furusawa, Choji, 4,480,734, Cl. 192-20.000.
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Aisin Seki Kabushiki Kaisha: *See—*
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Akama, Hideo: *See—*
Noguchi, Hitoshi; Akiyama, Tomoyuki; Akama, Hideo; Okara, Hideo; and Yoshino, Hisao, 4,481,464, Cl. 324-57.0PS.

Akashi, Goro: *See—*
Matsufuji, Akihiro; Umemura, Shizuo; Kasuga, Akira; Miyatuka, Hajime; and Akashi, Goro, 4,481,253, Cl. 428-323.000.

Akeyama, Masamoto: *See—*
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, 4,480,910, Cl. 355-30.000.

Akiyama, Takehiro: *See—*
Suzuki, Hirokazu; and Akiyama, Takehiro, 4,481,427, Cl. 307-200.00A.

Akiyama, Tomoyuki: *See—*
Noguchi, Hitoshi; Akiyama, Tomoyuki; Akama, Hideo; Okara, Hideo; and Yoshino, Hisao, 4,481,464, Cl. 324-57.0PS.

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Dubois, Jean C.; Gazard, Maryse; Schue, Francois; Giral, Louis; Rolland, Michel; and Aldissi, Mahmoud, 4,481,132, Cl. 252-519.000.

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Alfred, Allan: *See—*
Jaxmar, Leif; and Alfred, Allan, 4,480,535, Cl. 99-476.000.

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Schulze, Werner, 4,480,967, Cl. 417-368.000.

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Wade, David W.; and Dawson, Graham G., 4,481,115, Cl. 210-727.000.

Allied Corporation: *See*—
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., 4,481,069, Cl. 156-623.00R.
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Blakeslee, Charles E.; and Alsenfelt, Ingemar, 4,480,658, Cl. 137-315.000.

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Johnson, Kalin S.; and Alsobrooks, Daniel E., 4,480,367, Cl. 29-157.10R.

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Conan, Jean, 4,480,444, Cl. 62-402.000.

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Spranger, Paul B., 4,481,663, Cl. 381-98.000.

Althaus, Stephen E.: *See*—
Jacobs, Henry W.; and Althaus, Stephen E., 4,481,592, Cl. 364-513.000.

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Hoy, Malcolm G.; and Ball, Michael M., 4,481,402, Cl. 219-137.00R.

Alzmann, Donald R.; Angelo, Michael; and Waldner, Paul R., to Lenkeit Industries, Inc. Method and apparatus for successively positioning sheets of material with precision for punching aligning holes in the sheets enabling the sheets to be used in the manufacture of composite circuit boards. 4,481,533, Cl. 358-101.000.

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Dreyer, Heinz, 4,480,948, Cl. 406-52.000.

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Marshall, Barry R.; and Knight, Paul A., 4,480,657, Cl. 137-103.000.

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AMCA International Corporation: *See*—
Oustad, Maynard A., 4,480,757, Cl. 212-257.000.

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Cone, Robert O., Jr.; and Carpenter, Charles R., 4,481,298, Cl. 436-500.000.

AMP Incorporated: *See*—
Hopkins, John R.; and Ritchie, Leon T., 4,480,888, Cl. 339-74.00R.

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Ravizza, Raymond F., 4,481,544, Cl. 360-10.200.
Rodal, David R., 4,481,449, Cl. 318-375.000.

Anahara, Meiji; Suzuki, Yoshihisa; Takasu, Shigeru; and Omori, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. False-twist nozzle. 4,480,435, Cl. 57-333.000.

Ananthan, Manickam: *See*—
Gilham, Dennis T.; Williams, Thomas D.; Ananthan, Manickam; and Herring, William J., 4,481,604, Cl. 364-900.000.

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Cheng, King Y.; and Carlson, Arthur J., 4,481,622, Cl. 370-30.000.

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Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.

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Alzmann, Donald R.; Angelo, Michael; and Waldner, Paul R., 4,481,533, Cl. 358-101.000.

Angelov, Angel B.: *See*—
Vassilev, Vassil B.; Sofiyanski, Vassil M.; Vassilev, Boris V.; Danchev, Panayot Y.; Angelov, Angel B.; Strandjaliev, Yordan M.; and Kehayov, Georgi S., 4,481,482, Cl. 330-297.000.

Anic S.p.A.: *See*—
Invernizzi, Renzo; and Ligorati, Ferdinando, 4,481,342, Cl. 526-125.000.

Annis, Jeffrey R.; and Gowda, Srinivasa R., to General Electric Company. X-Ray target attachment. 4,481,655, Cl. 378-125.000.

Anti-Fire Foam, Inc.: *See*—
Gray, Stanley D., 4,481,308, Cl. 521-120.000.

Antonitsch, Walter: *See*—
Scheurecker, Werner; and Antonitsch, Walter, 4,480,680, Cl. 164-442.000.

Antonov, Anatoly V.: *See*—
Safonnikov, Anatoly N.; and Antonov, Anatoly V., 4,481,400, Cl. 219-73.100.

Anzai, Shunju; Ibuchi, Yoshiaki; and Taniguchi, Akihiko, to Sharp Kabushiki Kisha. Thermal fixing roller system in a copying machine. 4,480,908, Cl. 355-14.0FU.

Aoki, Katsumichi; Kanda, Yoichi; Shida, Takafumi; Satake, Keigo; and Shinkawa, Hiroyasu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivatives of tetrahydrobenzothiazole and herbicidal compositions containing the same as an active ingredient. 4,481,027, Cl. 71-90.000.

Aparicio, Thomas, Jr.; Nagel, Dave D.; and Graham, Ron, to Gratec, Inc. Powered ratchet wrench. 4,480,510, Cl. 81-57.390.

Apontoweil, Peter; and Krasselt, Manfred M., to Gist-Brocades N.V. Vaccines. 4,481,188, Cl. 424-89.000.

Apperson, Kenneth P.: *See*—
Bush, Austin L.; Apperson, Kenneth P.; and Todd, Jerald C., 4,480,460, Cl. 72-410.000.

Aquatic Exercise Products, Inc.: *See*—
Yacoboski, Anton, 4,480,829, Cl. 272-116.000.

ARA Services, Inc.: *See*—
Jamgochian, Herbert H.; and Levasseur, Joseph L., 4,480,737, Cl. 194-4.00C.

Arakawa, Akira: *See*—
Imamura, Shuichiro; and Arakawa, Akira, 4,480,665, Cl. 139-97.000.

Araki, Kengo: *See*—
Tachibana, Shinro; Araki, Kengo; Ohya, Shizuko; and Yoshida, Seiji, 4,481,138, Cl. 260-112.50R.

Arc Technologies Systems Ltd.: *See*—
Zollner, Dieter; Conradty, Claudio; and Rittmann, Friedrich, 4,481,500, Cl. 373-93.000.

Archenholtz, Ake; and Bergman, Kjell, to ASEA Aktiebolag. Method for temperature control of inductors. 4,481,639, Cl. 373-150.000.

Arditty, Herve ; Papuchon, Michel; and Peuch, Claude, to Thomson-CSF. Ring interferometer device and its application to the detection of non-reciprocal effects. 4,480,915, Cl. 356-350.000.

Arellano, Yolanda M.: *See*—
Allen, Maria R., 4,480,519, Cl. 84-1.010.

Arima, Hideo; Kaneyasu, Masayoshi; and Ito, Mitsuko, to Hitachi, Ltd. Gas detector. 4,481,499, Cl. 338-34.000.

Arimatsu, Seiji: *See*—
Sakurai, Kiyomi; and Arimatsu, Seiji, 4,480,549, Cl. 101-456.000.

Arjomari-Prioux: *See*—
Dailly, Christian; and Gomez, Daniel, 4,481,075, Cl. 162-145.000.

Arkansas Patents, Inc.: *See*—
Davis, Robert E., 4,480,985, Cl. 431-1.000.

Asahi-Dow Limited: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,481,334, Cl. 525-211.000.

Asahi Fiber Glass Company Limited: *See*—
Kawashima, Sadao; and Takei, Heiichi, 4,481,241, Cl. 428-134.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Nohmi, Takashi, 4,481,260, Cl. 428-398.000.

Asai, Akimichi: *See*—
Yoshioka, Teruo; Miyazawa, Toshio; Uchida, Kuninobu; and Asai, Akimichi, 4,480,383, Cl. 29-822.000.

Asai, Hitohisa. Apparatus for speeding up digital division in radix-2^n machine. 4,481,600, Cl. 364-765.000.

Asano, Hiroshi; Shimamune, Takayuki; Hirao, Kazuhiro; and Hirayama, Ryuta, to Permelec Electrode Ltd. Durable electrode for electrolysis. 4,481,097, Cl. 204-290.00F.

Asano, Yuichiro; Suzuki, Taira; Yabe, Tadashi; Kurita, Kunio; Ohga, Suehisa; Hirahashi, Akira; and Momose, Atsushi, to Kawasaki Steel Corporation. Method and system for determining shape in plane to be

determined in atmosphere of scattering materials. 4,480,919, Cl. 356-376.000.

Asbury, Charles E.: *See*—
Clausen, Victor H.; and Asbury, Charles E., 4,481,054, Cl. 156-177.000.
Clausen, Victor H.; and Asbury, Charles E., 4,481,055, Cl. 156-177.000.
Clausen, Victor H.; and Asbury, Charles E., 4,481,065, Cl. 156-440.000.

ASEA Aktiebolag: *See*—
Archenholtz, Ake; and Bergman, Kjell, 4,481,639, Cl. 373-150.000.

Aspart, Alain; Guillaume, Bernard; and Moulin, Jean-Paul, to Commissariat A L'Energie Atomique. Process for the treatment of basic aqueous effluents. 4,481,135, Cl. 252-632.000.

Astapenok, Elena B.: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.

AT&T Bell Laboratories: *See*—
Baranyai, Lawrence; Colton, John R.; Lane, Michael S.; and Sosnowski, Thomas P., 4,481,624, Cl. 370-62.000.
Brus, Louis E.; and Nitzan, Abraham, 4,481,091, Cl. 204-157.10R.
Forson, Henry M., 4,481,577, Cl. 364-200.000.
Henry, Charles H.; and Logan, Ralph A., 4,481,631, Cl. 372-45.000.
Karabinis, Peter D., 4,481,645, Cl. 375-58.000.
Madon, James J., 4,481,383, Cl. 179-7.10R.
Mueller, Mark W., 4,481,583, Cl. 364-300.000.
Reichmanis, Elsa; and Smolinsky, Gerald, 4,481,049, Cl. 156-643.000.
Taylor, Carl R., 4,480,898, Cl. 350-96.300.
Vratny, Frederick, 4,481,251, Cl. 428-312.600.

AT&T Technologies, Inc.: *See*—
Alexandersen, John B.; and Karolik, Ivan J., 4,481,467, Cl. 324-72.500.
Beam, William D.; Chrisman, David C.; Cox, Lloyd R.; and Hankins, Charles R., 4,480,990, Cl. 432-9.000.

Atkins, John H., Sr., to A & B Industries, Inc. Thumb break holster having means for preventing forcible withdrawal of a hand gun therefrom. 4,480,776, Cl. 224-243.000.

Atlantic Richfield Company: *See*—
Wunderlich, Donald K., 4,480,689, Cl. 166-245.000.

Audio Systems, Inc.: *See*—
Tscheulin, Fred L.; Tilley, Donald R.; Schubert, Steven K.; and Skyllingstad, William G., 4,481,512, Cl. 340-825.250.

Automatic Connector, Inc.: *See*—
Morelli, John A., 4,480,887, Cl. 339-94.00C.

Autronics Corporation: *See*—
Price, Earl T.; and Allison, Arthur F., 4,481,667, Cl. 382-65.000.

Avco Corporation: *See*—
Suplinskas, Raymond J.; and Hauze, Albert W., 4,481,257, Cl. 428-366.000.

AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnick: *See*—
Kunzfeld, Wilhelm, 4,480,487, Cl. 73-862.450.

Avl Gesellschaft Fur Verbrennungskraftmaschinen Und Messtechnik m.b.H.: *See*—
Skatsche, Othmar; and Feichtinger, Gerhard, 4,480,601, Cl. 123-59.00B.

Axelson, Inc.: *See*—
Vanderburg, Ralph W., 4,480,653, Cl. 137-112.000.

Ayers, Ray R., to Shell Oil Company. Flexible pipeline joints. 4,480,858, Cl. 285-114.000.

B.A.T. Cigaretten-Fabriken GmbH: *See*—
Schumacher, Gerd; and Masurat, Heinz-Werner, 4,480,463, Cl. 73-38.000.

B. F. Goodrich Company, The: *See*—
Marshall, Kenneth D.; and Berzins, Michael A., 4,480,672, Cl. 152-209.00B.
Riew, Changkiu K., 4,481,148, Cl. 260-465.400.

Baacke, Michael; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Crystalline aluminosilicate and process for its production. 4,481,174, Cl. 423-306.000.

Baba, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Multiple mode palletizing apparatus. 4,480,953, Cl. 414-27.000.

Baba, Takao: *See*—
Nakai, Shiro; and Baba, Takao, 4,480,651, Cl. 133-3.00A.

Babcock & Wilcox Company, The: *See*—
Kaya, Azmi; and Lukas, Michael P., 4,481,567, Cl. 364-157.000.

Babuka, Robert; Burke, Andrea; and Haiges, Paul E., Jr., to International Business Machines Corporation. Zero insertion force connector and circuit card assembly. 4,480,884, Cl. 339-17.00L.

Bahler, Lawrence G., to Exxon Corporation. Continuous speech recognition. 4,481,593, Cl. 364-513.500.

Bailey, Joseph; Clarke, David; Crawley, Michael W.; Marsden, Peter D.; and Sidhu, Jasbir, to Eastman Kodak Company. Method of forming a photographic dye image. 4,481,268, Cl. 430-17.000.

Bailey, Keith A.; and Spurlin, Stephen F., to General Motors Corporation. Retarder brake control. 4,480,728, Cl. 188-271.000.

Baker Oil Tools, Inc.: *See*—
McStravick, David M.; and Chenoweth, David V., 4,480,371, Cl. 29-455.00R.

Balaban, Suchen, to Zenith Electronics Corporation. Switched-mode power supply. 4,481,564, Cl. 363-21.000.

Baldur, Roman: *See*—
Lague, Gerald; Baldur, Roman; Marois, Paul; Brossard, Maurice; Quevillon, Marc; Di Franco, Enrico; and Dugre, Robert, 4,480,586, Cl. 119-15.000.

Baldwin, James C.: *See*—
Rhein, Robert A.; Baldwin, James C.; and Beach, Charles L., 4,481,119, Cl. 252-2.000.

Baldwin, Willett, to Mobil Oil Corporation. Locating the relative trajectory of a relief well drilled to kill a blowout well. 4,480,701, Cl. 175-45.000.

Ball, John A.; and Scott, John W., to Sprague Electric Company. Process for anodizing aluminum foil. 4,481,083, Cl. 204-38.00A.

Ball, Michael M.: *See*—
Hoy, Malcolm G.; and Ball, Michael M., 4,481,402, Cl. 219-137.00R.

Balz, Gunther W.; and Upjohn, Henry L., to Roto-Finish Company, Inc. Finishing chamber with readily-removable lining and means for assisting with said removal, and finishing machine embodying the same. 4,480,411, Cl. 51-163.100.

Balz, Helmut. Method and apparatus for the regulated transfer of heat from a primary steam network to a heat consumer. 4,480,785, Cl. 237-6.000.

Bandoh, Tadaaki: *See*—
Fukunaga, Yasushi; Bandoh, Tadaaki; Matsumoto, Hidekazu; Hiraoka, Ryosei; Ide, Jushi; Kato, Takeshi; and Kawakami, Tetsuya, 4,481,573, Cl. 364-200.000.

Bangert, Wilfried: *See*—
Noll, Hans; Bangert, Wilfried; and Hacobs, Hans, 4,480,821, Cl. 266-54.000.

Banks, Robert L.: *See*—
Kukes, Simon G.; and Banks, Robert L., 4,481,377, Cl. 585-646.000.

Banner, Bruce T.: *See*—
Bolton, Theodore S.; Napolitano, James E.; and Banner, Bruce T., 4,480,533, Cl. 98-38.00B.

Banta, Edward M.; and Fitzgerald, Kenneth D., to Denka Chemical Corporation. Process for instantaneous peptization of chloroprene-sulfur copolymers. 4,481,313, Cl. 524-84.000.

Baran, Stanley J.; Van Camp, John; and George, Kurudamannil A., to Proctor & Schwartz, Inc. Reactor for dry flue gas desulfurization. 4,481,171, Cl. 422-176.000.

Baranyai, Lawrence; Colton, John R.; Lane, Michael S.; and Sosnowski, Thomas P., to AT&T Bell Laboratories. Linear time division multiplexed conferencer. 4,481,624, Cl. 370-62.000.

Barbour, Robert G. Rail mount anchor bracket. 4,480,573, Cl. 114-210.000.

Barcelow, David M.; Callahan, John R.; and Johnson, Michael T., to Innovative Concepts in Entertainment, Inc. Amusement game. 4,480,833, Cl. 273-85.00B.

Bareket, Noah; and Metheny, Wayne W., to United States of America, Navy. Phase-modulated polarizing interferometer. 4,480,916, Cl. 356-351.000.

Barling, Donald E.; and Barling, John W. Tie structure. 4,480,358, Cl. 24-115.00G.

Barling, John W.: *See*—
Barling, Donald E.; and Barling, John W., 4,480,358, Cl. 24-115.00G.

Barnes, John F.: *See*—
Root, Jon C.; Barnes, John F.; and Rosson, Dennis M., 4,481,122, Cl. 252-32.70E.

Barnett, George H.: *See*—
Markus, Michael V.; and Barnett, George H., 4,481,306, Cl. 521-31.000.

Barnette, Luverne H.: *See*—
Bowden, William L.; Barnette, Luverne H.; and DeMuth, David L., 4,481,267, Cl. 429-194.000.

Barr, Thomas A. Particulate collecting apparatus. 4,480,349, Cl. 15-4.000.

Barrett, James H., Jr. Battery cell covers with snap-on cable retainers. 4,481,269, Cl. 429-121.000.

Barthel, Horst K. F., to Hughes Tool Company. Viscosifier for oil base drilling fluids. 4,481,121, Cl. 252-8.50M.

BASF Aktiengesellschaft: *See*—
Dockner, Toni; Pommer, Ernst-Heinrich; and Wetzler, Matthias, 4,481,211, Cl. 424-273.00R.
Eckell, Albrecht; Eilingsfeld, Heinz; Elzer, Albert; Feichtmayr, Franz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,481,272, Cl. 430-58.000.
Straehle, Wolfgang; Buethe, Ingolf; and Marx, Matthias, 4,481,309, Cl. 521-172.000.

Battelle Memorial Institute: *See*—
Milosh, Michael D.; and Geoghegan, Robert J., 4,480,666, Cl. 144-194.000.

Battson, Donald F.; and Savoye, Eugene D., to RCA Corporation. Overcoming flicker in field-interlaced CCD imagers with three-phase clocking of the image register. 4,481,538, Cl. 358-213.000.

Baumgen, Heinz: *See*—
Sackmann, Gunter; Kolb, Gunter; Probst, Joachim; Muller, Friedhelm; and Baumgen, Heinz, 4,481,319, Cl. 524-213.000.

Bayart, Martin; Grincourt, Bernard; and Chabierski, Rene , to S.A. Etablissements SARASIN et Cie. Safety valve. 4,480,660, Cl. 137-478.000.

Bayer Aktiengesellschaft: *See*—
Bruck, Dieter W.; Jeblick, Werner; and Ruetz, Lothar, 4,481,321, Cl. 524-243.000.
Ebneth, Harold; Preis, Lothar; Giesecke, Henning; and Wolf, Gerhard D., 4,481,249, Cl. 428-288.000.

Forster, Heinz; Ese, Ludwig; Schmidt, Robert; and Lurssen, Klaus, 4,481,365, Cl. 556-422.000.
Hentschel, Karl-Heinz; Dhein, Rolf; Kussi, Siegfried; Winter, Hans; and Vojacek, Herbert, 4,481,123, Cl. 252-52.00R.
Hocker, Jurgen; Merten, Rudolf; and Willenberg, Bernd, 4,481,312, Cl. 524-40.000.
Nachtkamp, Klaus; Bock, Manfred; Halpaap, Reinhard; and Pedain, Josef, 4,481,345, Cl. 528-59.000.
Sackmann, Gunter; Kolb, Gunter; Probst, Joachim; Muller, Friedhelm; and Baumgen, Heinz, 4,481,319, Cl. 524-213.000.
Schlak, Ottfried; Michel, Werner; and Munchenbach, Bernard, 4,481,341, Cl. 525-478.000.
Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, 4,481,350, Cl. 528-167.000.
Serini, Volker; Nouvertne, Werner; and Freitag, Dieter, 4,481,338, Cl. 525-394.000.

Bays, David E.: *See*—
Carey, Linda; Price, Barry J.; Clitherow, John W.; Bradshaw, John; Martin-Smith, Michael; Bays, David E.; and Blatcher, Philip, 4,481,199, Cl. 424-246.000.

Bazlen, Dieter; Hajdu, Johann; and Knauft, Gunter, to International Business Machines Corporation. Arrangement in a data processing system to reduce the cycle time. 4,481,575, Cl. 364-200.000.

Beach, Charles L.: *See*—
Rhein, Robert A.; Baldwin, James C.; and Beach, Charles L., 4,481,119, Cl. 252-2.000.

Beale, James; and Viles, Robert F., to Fosroc International Limited. Cement compositions. 4,481,037, Cl. 106-104.000.

Beam, William D.; Chrisman, David C.; Cox, Lloyd R.; and Hankins, Charles R., to AT&T Technologies, Inc. Article support rack and methods of weighting down articles. 4,480,990, Cl. 432-9.000.

Beard, Robert W., to Oximetrix, Inc. Cutting device and method of manufacture. 4,481,057, Cl. 156-216.000.

Beauchesne, Robert C.; and Russell, Robert J., to Honeywell Information Systems Inc. Embedded memory testing method and apparatus. 4,481,627, Cl. 371-21.000.

Beaudoin, Albert L., to Blanchard, Roger C. Rake with tine reinforcing chain. 4,480,431, Cl. 56-400.170.

Beaver, Ivan D.: *See*—
Harper, Allan C.; Jones, Edwin L.; and Beaver, Ivan D., 4,480,440, Cl. 60-605.000.

Becht, Carl T., to Senco Products, Inc. Ligating device. 4,480,640, Cl. 128-325.000.

Becker, Wilhelm: *See*—
Marten, Manfred; and Becker, Wilhelm, 4,481,349, Cl. 528-120.000.

Bedere, Serge; Borgoltz, Jean-Phillippe; and Moussin, Claude, to Commissariat A l'Energie Atomique. Diamond synthesis process. 4,481,180, Cl. 423-446.000.

Beecham Group Limited: *See*—
Evans, John M., 4,481,213, Cl. 424-283.000.
Utting, Kenneth; Khan, Karrar A.; and Callander, Sidney E., 4,481,209, Cl. 424-271.000.

Beecham Group p.l.c.: *See*—
Evans, John M., 4,481,214, Cl. 424-283.000.
Sutherland, Robert; and Slocombe, Brian, 4,481,210, Cl. 424-271.000.

Beehive Machinery, Inc.: *See*—
McFarland, Archie R.; Middleton, Jack C.; and dos Santos, Claudio, 4,480,980, Cl. 425-131.100.

Behrens, Rainer; Peissl, Dieter; Schondelmayer, Jurgen; and Brach, Ulrich, to Lever Brothers Company. Child-proof closure. 4,480,759, Cl. 215-220.000.

Behringwerke Aktiengesellschaft: *See*—
Gels, Reiner, 4,481,291, Cl. 435-6.000.
Habenstein, Klaus, 4,481,295, Cl. 436-66.000.

Beier, Heinz: *See*—
Vaubel, Gert; and Beier, Heinz, 4,480,976, Cl. 425-186.000.

Belko, Robert P.: *See*—
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., 4,480,647, Cl. 131-276.000.

Beloit Corporation: *See*—
Paraskevas, Stavros, 4,480,796, Cl. 241-46.110.

Belokin, Paul, Jr. Display rack for lightweight merchandise. 4,480,756, Cl. 211-126.000.

Belshaw Bros., Inc.: *See*—
Brown, Amos J., 4,480,767, Cl. 222-340.000.

Bemis Company, Inc.: *See*—
Jacobs, Richard W., 4,480,752, Cl. 206-632.000.

Bengtsson, Nils K.; and Ljung, Egil K., to SAB Industri AB. Electromagnetic track brake for a railway vehicle. 4,480,727, Cl. 188-165.000.

Bennett, Milton D. Hot water cutoff safety valve for showers. 4,480,784, Cl. 236-93.00B.

Benson, James A.; and Buccini, Amadio D., to Philmont Electronics, Inc. Coordinator for traffic signal controller. 4,481,515, Cl. 340-912.000.

Benteler-Werke AG: *See*—
Vaubel, Gert; and Beier, Heinz, 4,480,976, Cl. 425-186.000.

Benziger, Theodore M., to United States of America, Energy. Method of making fine-grained triaminotrinitrobenzene. 4,481,371, Cl. 564-406.000.

Beondu A.G.: *See*—
Deckers, Jan H., 4,480,591, Cl. 122-14.000.

Bercaw, Kenneth K.: *See*—
Shank, William E.; and Bercaw, Kenneth K., 4,480,412, Cl. 51-165.00R.

Bergamin, Vito, to Zetronic S.p.A. Quick connector for a multi-conductor circuit. 4,480,886, Cl. 339-75.0MP.

Bergemann, Klaus-Dieter; Deike, Karl-Heinz; Kiel, Bernd-Joachim; and Konig, Heinz-Werner, to Wabco Fahrzeugbremsen GmbH. Pneumatic relay valve. 4,480,663, Cl. 137-627.500.

Bergen, Franciscus H. M., to U.S. Philips Corporation. Television camera comprising a focusing arrangement. 4,481,540, Cl. 358-227.000.

Bergman, Kjell: *See*—
Archenholtz, Ake; and Bergman, Kjell, 4,481,639, Cl. 373-150.000.

Bergstrom, Per-Olof: *See*—
Ahlen, Karl-Gustav; and Bergstrom, Per-Olof, 4,480,503, Cl. 74-766.000.

Bergwerksverband GmbH: *See*—
Kemper, Franz, 4,480,789, Cl. 239-116.000.

Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., to Berke, Joseph J. Computer terminal support and hand rest. 4,481,556, Cl. 361-222.000.

Berkemeier, Donald E., to LOF Plastics Inc. Security cover for an automobile storage compartment. 4,480,675, Cl. 160-121.00C.

Berkowitz, Edward H., to Varian Associates, Inc. Reentrant asynchronous FIFO. 4,481,608, Cl. 364-900.000.

Berrigan, James H., to Neils, William C. Coolant recovery and de-aeration system for liquid-cooled internal combustion engines. 4,480,598, Cl. 123-41.270.

Bert, Alain; and Kaminsky, Didier, to Thomson-CSF. Ultra-high frequency oscillator with dielectric resonator of the compact hybrid circuit type. 4,481,486, Cl. 331-99.000.

Bertram, James L.; and Davis, William, to Dow Chemical Company, The. Epoxy resins containing phosphorus. 4,481,347, Cl. 528-102.000.

Bertrams, Rainer B. Boat with seismic gun jib. 4,480,574, Cl. 114-254.000.

Berzins, Michael A.: *See*—
Marshall, Kenneth D.; and Berzins, Michael A., 4,480,672, Cl. 152-209.00B.

Beukers, John M.; and Williams, Christian B., to Beukers Laboratories, Inc. Microprocessor based radiosonde. 4,481,514, Cl. 340-870.100.

Beukers Laboratories, Inc.: *See*—
Beukers, John M.; and Williams, Christian B., 4,481,514, Cl. 340-870.100.

Beutel, Jacob; and LeStrange, Raymond J., to Du Pont de Nemours, E. I., and Company. Silver halide emulsion containing a purified cysteine-glutaraldehyde polymer fraction and process of making. 4,481,359, Cl. 546-114.000.

Beyer, Joachim: *See*—
Beyer, Walter; and Beyer, Joachim, 4,480,563, Cl. 112-222.000.

Beyer, Walter; and Beyer, Joachim, to Zimmermann, Jos. Tufting needle. 4,480,563, Cl. 112-222.000.

Bianchi, Giuseppe; and Milocco, Claudio, to Industrie Zanussi S.p.A. Dishwasher with electrochemical cell. 4,481,086, Cl. 204-78.000.

Bibb, Albert E.: *See*—
Steeves, Arthur F.; and Bibb, Albert E., 4,481,043, Cl. 148-20.300.

Bicknell, John, to U.S. Philips Corporation. Method of storing data in a memory of a data processing system. 4,481,576, Cl. 364-200.000.

Bigelow-Sanford, Inc.: *See*—
Wind, Joseph H., 4,480,748, Cl. 206-386.000.

Binet, Jean: *See*—
Manoury, Philippe; Binet, Jean; and DeFosse, Gerard, 4,481,207, Cl. 424-267.000.

BioResearch Inc.: *See*—
Kurtz, Leonard D., 4,481,008, Cl. 604-118.000.

Bishop, Malcolm J., to Ferranti, PLC. Automatic electrical motor speed control. 4,481,448, Cl. 318-248.000.

Bissell, Marian J.: *See*—
Trefethern, George M.; and Bissell, Marian J., 4,480,568, Cl. 114-61.000.

Black, Billy E.: *See*—
May, James R.; and Black, Billy E., 4,480,704, Cl. 175-228.000.

Blackmon, Laura M. Multi-sectioned storage case. 4,480,744, Cl. 206-1.700.

Blais, Christina G., heiress: *See*—
Ward, Jarrel D.; Turner, Richard E., deceased; Turner, Betty L., heiress; Blais, Christina G., heiress; Turner, Terry L., heiress; and Shurley, Jane E., heiress, 4,480,791, Cl. 239-533.150.

Blakeslee, Charles E.; and Alsenfelt, Ingemar, to Kockumation AB. Aspirator system for sound emitters. 4,480,658, Cl. 137-315.000.

Blanchard, Roger C.: *See*—
Beaudoin, Albert L., 4,480,431, Cl. 56-400.170.

Blaskowski, Henry J., to Combustion Engineering, Inc. Coal and char burner. 4,480,559, Cl. 110-347.000.

Blatcher, Philip: *See*—
Carey, Linda; Price, Barry J.; Clitherow, John W.; Bradshaw, John; Martin-Smith, Michael; Bays, David E.; and Blatcher, Philip, 4,481,199, Cl. 424-246.000.

Blenkinsop, Philip T.: *See*—
Needham, Robert J.; and Blenkinsop, Philip T., 4,480,407, Cl. 49-168.000.

Bloemers, James L., to Brunswick Corporation. Recoil starter. 4,480,605, Cl. 123-185.0BA.

Blomqvist, Ake; and Forsgren, Roland, to Aktiebolaget Bofors. Means for reducing gun firing dispersion. 4,480,524, Cl. 89-41.00M.

Bly, Lloyd G., to M. H. Detrick Company. Heat recovery system for glass tank furnaces. 4,481,024, Cl. 65-337.000.

BMC Industries, Inc.: *See*—
Kosmowski, Wojciech B., 4,480,364, Cl. 29-56.600.

Board of Regents, The University of Texas System: *See*—
Folkers, Karl; and Jie-cheng, Xu, 4,481,139, Cl. 260-112.50R.

Bock, Erich: *See*—
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Bock, Manfred: *See*—
Nachtkamp, Klaus; Bock, Manfred; Halpaap, Reinhard; and Pedain, Josef, 4,481,345, Cl. 528-59.000.

Bodem, George B.; and Michno, Drake M., to Eastman Kodak Company. 4-Hydroxyalkyl-substituted 3-pyrazolidinone electron transfer agents. 4,481,287, Cl. 430-483.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Branched chain olefinic alcohols, thiols, esters and ethers, organoleptic uses thereof, processes for preparing same and intermediates therefor. 4,480,646, Cl. 131-276.000.

Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Flavoring with a 1-hydroxymethyl-2-acyl cyclopropane derivative. 4,481,225, Cl. 426-538.000.

Boden, Richard M.; Temes, Steven D.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Process for preparing allyl alpha and beta ionones and intermediates therefor. 4,481,372, Cl. 568-378.000.

Boden, Richard M.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,481,221, Cl. 426-3.000.

Boeing Company, The: *See*—
Doubt, Roark M., 4,481,081, Cl. 204-15.000.
Inglee, Clinton F., 4,481,417, Cl. 250-338.000.
Van De Bogart, Lloyd J., 4,480,949, Cl. 407-54.000.

Bogan, Thomas R.: *See*—
Lavins, Paul N.; and Bogan, Thomas R., 4,481,398, Cl. 219-10.690.

Boggs, David R.; and Shoch, John F., to Xerox Corporation. Transceiver multiplexor. 4,481,626, Cl. 370-85.000.

Bogovich, Robert E., to United States Steel Corporation. Controlled counter-drafting to reduce crop loss during ingot rolling. 4,480,458, Cl. 72-229.000.

Bohrer, Kathryn A.; and Edgar, Albert D., to International Business Machines Corporation. Font compression and decompression for character generation. 4,481,602, Cl. 364-900.000.

Bolick, Virgil T., Jr.; Brownell, Kenneth W., Jr.; and Elliott, Michael W., to Brand-Rex Company. Shielded flat communication cable. 4,481,379, Cl. 174-36.000.

Bollinger, Lawrence R., to United States of America, Energy. Reactivity control assembly for nuclear reactor. 4,481,164, Cl. 376-233.000.

Bolon, Donald A., to General Electric Company. Acid-extended copolyamideimides and method for their preparation. 4,481,339, Cl. 525-424.000.

Bolton, Theodore S.; Napolitano, James E.; and Banner, Bruce T., to Carrier Corporation. Control for vent door. 4,480,533, Cl. 98-38.00B.

Bolzt, Jean; and Calame, Jean-Pierre, to Fabriques d'Horlogerie de Fontainemelon S.A. Method of attaching a resonator casing to a printed circuit. 4,480,384, Cl. 29-840.000.

Bondurant, David W.: *See*—
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Boogers, Wilhelmus P. L., to P.M.B. Patent Machinebouw, B.V. Method for manufacturing a punching unit. 4,480,507, Cl. 76-107.00C.

Bools, William G.: *See*—
Owen, Louis L.; Horujko, Mark P.; and Bools, William G., 4,481,553, Cl. 361-93.000.

Borgoltz, Jean-Phillippe: *See*—
Bedere, Serge; Borgoltz, Jean-Phillippe; and Moussin, Claude, 4,481,180, Cl. 423-446.000.

Borne, Andre ; Marmonier, Andre ; and Briguet, Etienne, to Cgee Alsthom. Rotary electric switch with an automatic mechanism which resets it when no voltage is applied thereto. 4,481,492, Cl. 335-164.000.

Borsting, Otto W.: *See*—
Card, Lorin P.; and Borsting, Otto W., 4,480,811, Cl. 251-14.000.

Bortnick, Kenneth A. Fail safe sterilizing apparatus and a circuit therefor. 4,481,410, Cl. 219-521.000.

Bose, Bimal K.: *See*—
Zach, Franz C.; Bose, Bimal K.; Espelage, Paul M.; and Sicko, John S., 4,481,457, Cl. 318-803.000.

Bosshart, George S.; and Matarese, Alfred P., to United Technologies Corporation. Method of applying ceramic coatings on a metallic substrate. 4,481,237, Cl. 427-376.400.

Bottenbruch, Ludwig: *See*—
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Boudy, Francoise: *See*—
Grollier, Jean-Francois; and Boudy, Francoise, 4,481,185, Cl. 424-59.000.

Bouldin, Dennis P.; Hallock, Dale P.; Roberts, Stanley; and Ryan, James G., to International Business Machines Corporation. Method for making diffusions into a substrate and electrical connections thereto using silicon containing rare earth hexaboride materials. 4,481,046, Cl. 148-188.000.

Bourget, Jean-Paul: *See*—
Renaud, Patrick; and Bourget, Jean-Paul, 4,480,792, Cl. 239-533.600.

Bourguignon, Serge P. L.; Choque, Raymond R.; and Pham, Lucien P., to S.N.E.C.M.A. Device for damping vibrations of mobile turbine blades. 4,480,959, Cl. 416-220.00R.

Bowden, William L.; Barnette, Luverne H.; and DeMuth, David L., to Duracell Inc. Insoluble heavy metal polysulfide cathodes. 4,481,267, Cl. 429-194.000.

Bowen, Arthur D. Wing chute deployment system. 4,480,807, Cl. 244-139.000.

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Box, Stephen J. C.; Kovach, Ronald J.; and Desroziers, Andre J., to Photochemical Research Associates Inc. Spark gap switch. 4,481,630, Cl. 372-38.000.

Boyer, Arthur L.; and Goitein, Michael, to Massachusetts General Hospital Corporation, The. Fringe pattern method and apparatus for producing X-ray dosage compensating filters. 4,480,920, Cl. 356-376.000.

Boyer, Barbara J.: *See*—
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Brach, Ulrich: *See*—
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Hawkins, Jeanette C.; Sella, Nancy W.; and Bradford, Carl D., 4,480,347, Cl. 5-490.000.

Bradshaw, James E.; and Pedersen, Norman E., to Panametrics, Inc. Acoustic flowmeter with envelope midpoint tracking. 4,480,485, Cl. 73-861.280.

Bradshaw, John: *See*—
Carey, Linda; Price, Barry J.; Clitherow, John W.; Bradshaw, John; Martin-Smith, Michael; Bays, David E.; and Blatcher, Philip, 4,481,199, Cl. 424-246.000.

Brak, Stephen B.: *See*—
Wach, Charles G.; Nelson, Robert E.; and Brak, Stephen B., 4,480,426, Cl. 53-576.000.

Bramer, Albert J., to M and M Technics AG. Method and device for rolling tube to a smaller diameter. 4,480,455, Cl. 72-95.000.

Brand-Rex Company: *See*—
Bolick, Virgil T., Jr.; Brownell, Kenneth W., Jr.; and Elliott, Michael W., 4,481,379, Cl. 174-36.000.

Brandrup, Johannes: *See*—
Fleischer, Dietrich; Weber, Eckhard; and Brandrup, Johannes, 4,481,333, Cl. 525-192.000.

Bratten, Jack R. Belt filter. 4,481,108, Cl. 210-137.000.

Bree, Charles E., to D. L. Auld Company, The. Manufacture of decorative emblems. 4,481,160, Cl. 264-135.000.

Breeden, Robert H., to Vickers, Incorporated. Power transmission. 4,480,438, Cl. 60-389.000.

Brehm, Gailon E.; and Scott, Bentley N., to Texas Instruments Incorporated. Monolithic microwave wide-band VCO. 4,481,487, Cl. 331-117.00D.

Brest Van Kempen, Carel J. H.: *See*—
Mahyera, Anil; Sweet, Robert M.; and Brest Van Kempen, Carel J. H., 4,480,842, Cl. 277-22.000.

Breveteam S.A.: *See*—
Tesch, Gunter; and Gieldanowski, Siegfried, 4,481,247, Cl. 428-234.000.

Bridgestone Tire Company, Ltd.: *See*—
Ogawa, Masaki; Hirata, Yasushi; and Tsuchikura, Akira, 4,481,327, Cl. 524-432.000.

Briguet, Etienne: *See*—
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Brimaud, Gilbert, to Valeo. Spot type brake with floating caliper. 4,480,725, Cl. 188-76.000.

British Aerospace Public Limited Company: *See*—
Truss, Peter, 4,480,415, Cl. 52-108.000.

British-American Tobacco Company Limited: *See*—
Luke, John A., 4,480,644, Cl. 131-68.000.

British Petroleum Company Limited, The: *See*—
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Broberg, Theodore W.; and Rathe, David D., to Honeywell Inc. Ring laser start up apparatus. 4,481,635, Cl. 372-94.000.

Brodeur, Rene H.; Terlecky, Boris S.; Sellberg, Ronald P.; and Halliar, William R. Articulated rail car for vehicular trailers. 4,480,554, Cl. 105-171.000.

Brookes, Ian R.; and Pick, Malcolm E., to Central Electricity Generating Board of Sudbury House. Process for the chemical dissolution of oxide deposits. 4,481,040, Cl. 134-3.000.

Brooks, George E. Sight and sound barrier. 4,480,715, Cl. 181-287.000.

Brossard, Maurice: *See*—
Lague, Gerald; Baldur, Roman; Marois, Paul; Brossard, Maurice; Quevillon, Marc; Di Franco, Enrico; and Dugre, Robert, 4,480,586, Cl. 119-15.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Takiguchi, Michitaka; and Sugaya, Takao, 4,481,507, Cl. 340-679.000.

Brown, Amos J., to Belshaw Bros., Inc. Apportioning and dispensing apparatus. 4,480,767, Cl. 222-340.000.

Brown, Edmund H., to United States of America, Commerce. Echometry device and method. 4,481,517, Cl. 343-5.0NA.

Brown, Herschel J. Anti-theft device for eyelet type trailer hitches. 4,480,450, Cl. 70-14.000.

Brown & Williamson Tobacco Corporation: *See*—
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., 4,480,982, Cl. 425-385.000.

Brownell, Kenneth W., Jr.: *See—*
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Bruck, Dieter W.; Jeblick, Werner; and Ruetz, Lothar, to Bayer Aktiengesellschaft. Process for increasing the ozone-resistance of a rubber with enol ethers. 4,481,321, Cl. 524-243.000.

Brugman, Johannes A.; and Hennequin, Petrus J., to Hunter Douglas International N.V. Clip for wall or ceiling panel structure. 4,480,360, Cl. 24-295.000.

Bruno, Graziella, to Medea Research s.r.l. Thiolactic acid derivative with bronchosecretogogue activity. 4,481,212, Cl. 424-275.000.

Brunswick Corporation: *See—*
Bloemers, James L., 4,480,605, Cl. 123-185.0BA.

Brus, Louis E.; and Nitzan, Abraham, to AT&T Bell Laboratories. Chemical processing using electromagnetic field enhancement. 4,481,091, Cl. 204-157.10R.

Bryson, Charles E., III: *See—*
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Buccini, Amadio D.: *See—*
Benson, James A.; and Buccini, Amadio D., 4,481,515, Cl. 340-912.000.

Buchele, Wesley F., to Iowa State University Research Foundation, Inc. Means and method for soil testing. 4,480,481, Cl. 73-784.000.

Bucher, Hans R.: *See—*
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Buchta, William M.; and Nagle, Dennis C., to Martin Marietta Corporation. Method of making refractory hard metal containing tiles for aluminum cell cathodes. 4,481,052, Cl. 156-155.000.

Buck, Robert; and Lichte, Norbert, to i f m electronic GmbH. Mounting structure for components of electronic switching device. 4,481,559, Cl. 361-395.000.

Budd Canada Inc.: *See—*
Chang, Yih-Yi; and Kungla, Rein, 4,480,604, Cl. 123-142.50E.

Buehler, Ernest: *See—*
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Buethe, Ingolf: *See—*
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Bukhteev, Boris M.: *See—*
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Bulmash, Robert; and Medley, Ernest H., Sr. Exercising apparatus. 4,480,832, Cl. 272-130.000.

Burke, Andrea: *See—*
Babuka, Robert; Burke, Andrea; and Haiges, Paul E., Jr., 4,480,884, Cl. 339-17.00L.

Burlett, Donald J.; and Parker, Dane K., to Goodyear Tire & Rubber Company, The. Process for the preparation of modified polymers. 4,481,337, Cl. 525-340.000.

Burns, Daniel E., to Demco Inc. Broccoli bunching and cutting apparatus. 4,480,536, Cl. 100-6.000.

Burrage, Eric C., to Shell Oil Company. Seismic cable compass system. 4,481,611, Cl. 367-19.000.

Burroughs Corporation: *See—*
Clark, Becky J., 4,481,623, Cl. 370-60.000.
Ross, Alexander, 4,481,061, Cl. 156-345.000.
Shultz, Richard E.; and Voecks, William F., Jr., 4,480,827, Cl. 271-111.000.

Burroughs Wellcome Co.: *See—*
Rideout, Janet L.; and Krenitsky, Thomas A., 4,481,197, Cl. 424-180.000.

Burroway, Gary L.: *See—*
Ambler, Michael R.; and Burroway, Gary L., 4,481,329, Cl. 524-501.000.

Bush, Austin L.; Apperson, Kenneth P.; and Todd, Jerald C., to Square D Company. Compression tool. 4,480,460, Cl. 72-410.000.

Butler Manufacturing Company: *See—*
Peat, Robert W.; and Daniel, John L., 4,480,927, Cl. 366-299.000.

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Cabestany, Jean; and Trouve, Claude, to Societe Francaise Hoechst. Cationic aminoplastic resin, preparation process and application thereof to water treatment. 4,481,116, Cl. 210-735.000.

Cady, Howard H.; and Lee, Kien-yin, to United States of America, Energy. Explosive double salts and preparation. 4,481,048, Cl. 149-47.000.

Cal Gavin Limited: *See—*
Gough, Martin J.; and Rogers, John V., 4,481,154, Cl. 261-94.000.

Calabro, Anthony D.; and Marchetti, Richard J., to Calabro, Anthony D. Heat dissipator for integrated circuit chips. 4,481,525, Cl. 357-81.000.

Calame, Jean-Pierre: *See—*
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Callahan, John R.: *See—*
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Callander, Sidney E.: *See—*
Utting, Kenneth; Khan, Karrar A.; and Callander, Sidney E., 4,481,209, Cl. 424-271.000.

Campbell, Nicoll A. D.; Dyer, Henry B.; Dietrich, Rainer; Phaal, Cornelius; and Reid, Douglas J. Method of making tool inserts and drill bits. 4,481,016, Cl. 51-295.000.

Campbell, Richard A., to Raytheon Company. Control circuit for low noise frequency agile oscillator. 4,481,484, Cl. 331-12.000.

Campsey, Ronald L.: *See—*
Rundell, Herbert A.; and Campsey, Ronald L., 4,480,688, Cl. 166-123.000.

Camus, Jean-Paul: *See—*
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Canadian Patents and Development Limited: *See—*
Chow, Sherman M.; and Lee, Pok F., 4,481,640, Cl. 375-1.000.

Canevari, Gerard P., to Exxon Research & Engineering Co. Filter media and method for cleansing entrained oils from oil-in-water emulsions. 4,481,113, Cl. 210-680.000.

Cann, Frank E., Jr., to Columbus Standard, Inc. Pipe joint and apparatus therefor. 4,480,861, Cl. 285-334.200.

Canon Denshi Kabushiki Kaisha: *See—*
Kurihara, Hitoshi; and Wakazawa, Toru, 4,480,935, Cl. 400-145.200.

Canon Kabushiki Kaisha: *See—*
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Hiramatsu, Akira, 4,480,904, Cl. 354-479.000.
Ishiwata, Junichi, 4,481,598, Cl. 364-710.000.
Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, 4,481,273, Cl. 430-59.000.
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Maeda, Masaya, 4,481,551, Cl. 360-85.000.
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Tsuchiya, Hiroaki, 4,480,909, Cl. 355-14.0CH.

Capovilla, Ralph. Wheel alignment system. 4,480,389, Cl. 33-203.120.

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Angelini, Peter; Caputo, Anthony J.; Hutchens, Richard E.; Lackey, Walter J.; and Stinton, David P., 4,481,134, Cl. 252-628.000.

Card, Lorin P.; and Borsting, Otto W., to VSI Corporation. Fail-safe actuator device. 4,480,811, Cl. 251-14.000.

Carey, Linda; Price, Barry J.; Clitherow, John W.; Bradshaw, John; Martin-Smith, Michael; Bays, David E.; and Blatcher, Philip, to Glaxo Group Limited. 1,2,4-Triazole-3-amine and 1,2,4 triazole-3,5-diamine compounds and their pharmaceutical use. 4,481,199, Cl. 424-246.000.

Carlson, Arthur J.: *See—*
Cheng, King Y.; and Carlson, Arthur J., 4,481,622, Cl. 370-30.000.

Carlson, Ronald R.: *See—*
Wilson, Kermit H.; and Carlson, Ronald R., 4,480,556, Cl. 108-48.000.

Carpenter, Charles R.: *See—*
Cone, Robert O., Jr.; and Carpenter, Charles R., 4,481,298, Cl. 436-500.000.

Carpentier, Urgel R., to Plattsburgh Foundry, Inc. Trap with reduced force opening means. 4,480,812, Cl. 251-87.000.

Carr, Walter J., Jr.: *See—*
Miller, Robert C.; and Carr, Walter J., Jr., 4,481,471, Cl. 324-240.000.

Carre, Jean-Jacques, to Societe Anonyme D.B.A. Braking assistance servomotor with a force amplification system between the piston and the output member. 4,480,526, Cl. 91-374.000.

Carreno, Diether E.: *See—*
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Carrier Corporation: *See—*
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Carruthers, Thomas F.; Weller, Joseph F.; and Taylor, Henry F., to United States of America, Navy. Optically triggered transferred-electron device microwave burst and single pulse generators. 4,481,485, Cl. 331-66.000.

Carse, Murray D. Dental pinning device. 4,480,998, Cl. 433-225.000.

Carson, William M. Adjustable reflector apparatus. 4,480,895, Cl. 350-623.000.

Cartwright, Jerry G., to Wesco Manufacturing, Inc. Tool storage device. 4,480,755, Cl. 211-60.00T.

Casbolt, Jeffrey N.: *See—*
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Cash, Carson D., III: *See—*
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Casio Computer Co., Ltd.: *See—*
Kobayashi, Saburo; and Yoshida, Takao, 4,481,607, Cl. 364-900.000.
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Casperson, Lee W.: *See—*
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Cather, Robert L., to Westinghouse Electric Corp. Slide and swing chassis assembly for electronic equipment. 4,480,880, Cl. 308-6.00R.
Cazaubon, Catherine; Diaz, Joseph; Guegan, Remy; Castro, Bernard; Evin, Genevieve; Corvol, Pierre; and Gagnol, Jean-Pierre, to SANOFI; and Institut Nationale de la Sante et de la Recherche Medicale. Acid-protease inhibiting peptide derivatives. 4,481,192, Cl. 424-177.000.
Cazaux, Joel; and Pietryka, Joseph, to Fives-Cail Babcock. Apparatus for controlling and guiding oscillations of a continuous casting mold. 4,480,678, Cl. 164-416.000.
Celotex Corporation, The: *See*—
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Central Electricity Generating Board of Sudbury House: *See*—
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Centre National d'Etudes Spatiales: *See*—
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Century Science Corp.: *See*—
Rubin, David, 4,481,195, Cl. 424-180.000.
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Cessna Aircraft Company, The: *See*—
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Borne, Andre ; Marmonier, Andre ; and Briguet, Etienne, 4,481,492, Cl. 335-164.000.
Chabierski, Rene : *See*—
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Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., to Allied Corporation. Hydrothermal crystal growing process. 4,481,069, Cl. 156-623.00R.
Chaki, Takao, to Clarion Co., Ltd. Crank mechanism in a pushbutton tuner. 4,480,489, Cl. 74-10.330.
Chamdru, Jacques, to Regie Nationale des Usines Renault. Device for grasping and transporting objects and a method for finishing said objects with the aid of such a device. 4,480,865, Cl. 294-87.00R.
Champion International Corporation: *See*—
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Chang, Jaw-Kang: *See*—
Wei, Edward T.; Lee, Nancy M.; and Chang, Jaw-Kang, 4,481,191, Cl. 424-177.000.
Chang, Paul P. H.; and Chu, Cheng-Hsiang. Silencer of anti-reverse fishing reel. 4,480,802, Cl. 242-84.20R.
Chang, Yih-Yi; and Kungla, Rein, to Budd Canada Inc. Engine block heater. 4,480,604, Cl. 123-142.50E.
Chang, Yin-Jenn. Multi-suit card game. 4,480,840, Cl. 273-292.000.
Chapman, Eugene K., to Research Engineering & Manufacturing. Apparatus for generating lobular polygonal forms. 4,480,506, Cl. 76-4.000.
Charles of the Ritz Group Ltd.: *See*—
Deckner, George E., 4,481,186, Cl. 424-59.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
De Fazio, Thomas L., 4,480,918, Cl. 356-373.000.
Charlot, Lincoln H., Jr., to Security Tag Systems, Inc. Batteryless, portable, frequency divider useful as a transponder of electromagnetic radiation. 4,481,428, Cl. 307-219.100.
Chase, John G. Device for dependently supporting potted plants having visual moisture-indicating means. 4,480,465, Cl. 73-73.000.
Chase, Karl L., to Sperry Corporation. Display vector generator utilizing sine/cosine accumulation. 4,481,605, Cl. 364-719.000.
Chauviere, Henri: *See*—
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Hofmann, Peter, 4,481,147, Cl. 260-410.90R.
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Shida, Mitsuzo; Zeitlin, Robert; Machonis, John, Jr.; and Adur, Ashok M., 4,481,262, Cl. 428-441.000.
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Chen, Yung J.; and Hodgman, Rick K., to McDonnell Douglas Corporation. High density MNOS transistor with ion implant into nitride layer adjacent gate electrode. 4,481,527, Cl. 357-23.000.
Cheng, King Y.; and Carlson, Arthur J., to Anderson Jacobson, Inc. High speed dial-up telephone circuit full duplex data transmission techniques. 4,481,622, Cl. 370-30.000.
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McStravick, David M.; and Chenoweth, David V., 4,480,371, Cl. 29-455.00R.
Chernov, Vladimir A.: *See*—
Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia F., administrator, 4,481,201, Cl. 424-250.000.
Chesnut, Robert B.: *See*—
Anderson, Nathaniel C.; Chesnut, Robert B.; and Daby, Larry E., 4,481,071, Cl. 156-656.000.
Chevron Research Company: *See*—
Anderson, Donald J., 4,480,695, Cl. 166-303.000.
Mitchell, David S., 4,481,099, Cl. 208-11.0LE.
Streib, Stephen F., 4,480,960, Cl. 417-12.000.
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Sakai, Kazuaki; Sato, Tuneyasu; and Chiba, Kazuhiko, 4,481,073, Cl. 162-30.100.
Chicurel, Ricardo U.; and Aguirre, Manuel G., to Vitro Tec Fideicomiso. Lehr loader apparatus. 4,480,741, Cl. 198-430.000.
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Nyilas, Emery; and Chiu, Tin-Ho, 4,481,353, Cl. 528-303.000.
Childs, Everett L., to United States of America, Energy. Decontaminating metal surfaces. 4,481,090, Cl. 204-129.750.
Chin, Herbert A.: *See*—
Winfree, Jules P.; Chin, Herbert A.; and O'Connell, Thomas E., 4,481,047, Cl. 148-429.000.
Chiu, Tin-Ho: *See*—
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Choque, Raymond R.: *See*—
Bourguignon, Serge P. L.; Choque, Raymond R.; and Pham, Lucien P., 4,480,959, Cl. 416-220.00R.
Chou, Hsin-hsin: *See*—
Kolpe, Vasant V.; Sherman, Dudley M.; Hendrickson, William A.; and Chou, Hsin-hsin, 4,481,234, Cl. 427-71.000.
Chou, Tai-Sheng, to Mobil Oil Corporation. Processing of hydrocarbons in fixed catalyst bed with redistribution means. 4,481,105, Cl. 208-146.000.
Chow, Sherman M.; and Lee, Pok F., to Canadian Patents and Development Limited. Spread spectrum modem. 4,481,640, Cl. 375-1.000.
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Beam, William D.; Chrisman, David C.; Cox, Lloyd R.; and Hankins, Charles R., 4,480,990, Cl. 432-9.000.
Christensen, Ray G.: *See*—
Nelson, Richard H.; Christensen, Ray G.; and Stedman, David, 4,480,986, Cl. 431-37.000.
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Christophe, Theophile J.; and Moatti, Jean-Claude P., to Moatti, Georges. Self-cleaning filter with motor incorporated therewith. 4,481,111, Cl. 210-333.010.
Christopher, Todd J., to RCA Corporation. Bias supply for A.C. line powered apparatus. 4,481,429, Cl. 307-296.00R.
Chu, Cheng-Hsiang: *See*—
Chang, Paul P. H.; and Chu, Cheng-Hsiang, 4,480,802, Cl. 242-84.20R.
Chu, John Y.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Chu, John Y.; and Kabakoff, Bruce D., 4,481,198, Cl. 424-236.000.
Chu, Nan S.; Kanner, Bernard; and Schilling, Curtis L., Jr., to Union Carbide Corporation. Preparation of aminopropyltrialkoxysilanes and/or aminoalkylalkoxysilanes. 4,481,364, Cl. 556-413.000.
Chu, Pochen, to Mobil Oil Corporation. Manufacture of low sodium zeolite. 4,481,173, Cl. 423-277.000.
Chugunny, Evgeny G.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Shumikhin, Vladimir S.; Kucherenko, Sergei V.; Zhelnis, Mechislav V.; and Zemlyavichus, Pranas V., 4,480,820, Cl. 266-44.000.
Chumsae, Mark S.: *See*—
Flanagan, Paul; and Chumsae, Mark S., 4,480,790, Cl. 239-214.250.
Ciba-Geigy AG: *See*—
Postle, Stephen R.; and Doyle, James, 4,481,252, Cl. 428-323.000.
Ciba-Geigy Corporation: *See*—
Mansfield, Kevin T., 4,481,092, Cl. 204-158.00R.
Rody, Jean; and Slongo, Mario, 4,481,315, Cl. 524-89.000.
CL Industries, Inc.: *See*—
Woodson, Wayne D., 4,481,310, Cl. 523-144.000.
Claeskens, Louis V.; and Van de Ven, George, to U.S. Philips Corporation. Method of and device for positioning electrical and/or electronic components on a substrate. 4,480,780, Cl. 228-180.00A.
Clamp-All Corp.: *See*—
Foresta, Anthony J.; and Tarara, James A., 4,480,860, Cl. 285-177.000.
Clarion Co., Ltd.: *See*—
Chaki, Takao, 4,480,489, Cl. 74-10.330.
Kawamura, Shigeru, 4,481,483, Cl. 330-297.000.
Clark, Becky J., to Burroughs Corporation. Speed independent arbiter switch employing M-out-of-N codes. 4,481,623, Cl. 370-60.000.
Clark, Brian C.: *See*—
Macht, Jon A.; and Clark, Brian C., 4,480,708, Cl. 180-6.480.
Clark, David A.; and Boyer, Barbara J., to R. R. Donnelley & Sons Company. Method of determining and storing color printing information. 4,481,532, Cl. 358-80.000.
Clark, Kenneth W.: *See*—
Fisher, Franklin D.; and Clark, Kenneth W., 4,480,578, Cl. 114-344.000.
Clark, William E., to Carrier Corporation. VAV Terminal local control loop. 4,480,783, Cl. 236-87.000.
Clarke, Charles J., Jr.: *See*—
Staggs, Kevin P.; Clarke, Charles J., Jr.; and Huntington, James C., 4,481,594, Cl. 364-521.000.
Clarke, David: *See*—
Bailey, Joseph; Clarke, David; Crawley, Michael W.; Marsden, Peter D.; and Sidhu, Jasbir, 4,481,268, Cl. 430-17.000.
Clausen, Victor H.; and Asbury, Charles E., to H. B. Fuller Company. Method of forming reinforcing network. 4,481,054, Cl. 156-177.000.

Clausen, Victor H.; and Asbury, Charles E., to H. B. Fuller Company. Method of forming reinforcing network. 4,481,055, Cl. 156-177.000.
Clausen, Victor H.; and Asbury, Charles E., to H. B. Fuller Company. Network reinforcing forming apparatus. 4,481,065, Cl. 156-440.000.
Clement, Ralph C.; Parmenter, Charles W.; and Lockwood, William T., to Siemens-Allis, Inc. Molded switch head. 4,481,391, Cl. 200-163.000.
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Carey, Linda; Price, Barry J.; Clitherow, John W.; Bradshaw, John; Martin-Smith, Michael; Bays, David E.; and Blatcher, Philip, 4,481,199, Cl. 424-246.000.
Coca-Cola Company, The: *See*—
Credle, William S., Jr., 4,480,969, Cl. 417-393.000.
Raymond, Wynn R., 4,481,292, Cl. 435-147.000.
Coe, Charles G.; and Kuznicki, Steven M., to Air Products and Chemicals, Inc. Polyvalent ion exchanged adsorbent for air separation. 4,481,018, Cl. 55-68.000.
Coffey, Gerald P.: *See*—
Curatolo, Benedict S.; and Coffey, Gerald P., 4,481,354, Cl. 528-487.000.
Cole, William A.: *See*—
Loge, David B.; Cole, William A.; and Migdal, Kevin J., 4,480,745, Cl. 206-44.00R.
Coleman, James H., to Upjohn Company, The. Treatment of panic disorders with estazolam. 4,481,208, Cl. 424-269.000.
Colgate Palmolive Company: *See*—
Sonenstein, Gerard G., 4,481,326, Cl. 524-377.000.
Collagen Corporation: *See*—
Graham, Thomas E.; and Sabelman, Eric E., 4,481,001, Cl. 434-267.000.
Collet, Erwin; and Loweg, Heribert, to Gewerkschaft Eisenbutte Westfalia. Aligning and locating apparatus. 4,480,381, Cl. 29-746.000.
Collins, Christopher G. Swimming pool cleaning method and apparatus. 4,481,117, Cl. 210-776.000.
Colt Industries Operating Corp: *See*—
Johnson, Kalin S.; and Alsobrooks, Daniel E., 4,480,367, Cl. 29-157.10R.
Colton, John R.: *See*—
Baranyai, Lawrence; Colton, John R.; Lane, Michael S.; and Sosnowski, Thomas P., 4,481,624, Cl. 370-62.000.
Colton, Robert M., to RCA Corporation. Core reset for single-ended dc-to-dc converter. 4,481,565, Cl. 363-56.000.
Columbia Marking Tools, Inc.: *See*—
Krembel, Frank, Jr., 4,480,539, Cl. 101-18.000.
Columbus Standard, Inc.: *See*—
Cann, Frank E., Jr., 4,480,861, Cl. 285-334.200.
Combustion Engineering, Inc.: *See*—
Blaskowski, Henry J., 4,480,559, Cl. 110-347.000.
Schukei, Glen E.; Formanek, Frank J.; and Graf, Donald V., 4,480,841, Cl. 277-1.000.
Sullivan, Robert P.; and Jackson, Francis B., 4,480,594, Cl. 122-510.000.
Commanda, Ephrem E. Fluid powered generator. 4,480,709, Cl. 180-65.300.
Commins, Alfred D.: *See*—
Gilb, Tyrell T.; and Commins, Alfred D., 4,480,941, Cl. 403-232.100.
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Allemand, Robert; Gagelin, Jean-Jacques; and Tournier, Edmond, 4,481,420, Cl. 250-385.000.
Aspart, Alain; Guillaume, Bernard; and Moulin, Jean-Paul, 4,481,135, Cl. 252-632.000.
Bedere, Serge; Borgoltz, Jean-Phillippe; and Moussin, Claude, 4,481,180, Cl. 423-446.000.
Communication Systems, Inc.: *See*—
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Compagnie Continentale de Signalisation: *See*—
Hernandez, Charles, 4,481,536, Cl. 358-147.000.
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Goldaniga Rene F.; Walter, Geard; Walter G. W.; Glotin, Bernard J. P.; and Gallois, Daniel, 4,480,697, Cl. 166-372.000.
Compton, John I., to International Business Machines Corporation. Electromagnet drop time detection method. 4,481,473, Cl. 324-423.000.
Conan, Jean, to Alsthom-Atlantique. Deep mine cooling system. 4,480,444, Cl. 62-402.000.
Cone, Robert O., Jr.; and Carpenter, Charles R., to AMF Incorporated. Pre-precipitated double antibody immunoassay method. 4,481,298, Cl. 436-500.000.
Conrad, Ulrich, to Kannemeier & Koch GmbH. Nose band. 4,480,427, Cl. 54-6.00R.
Conradty, Claudio: *See*—
Zollner, Dieter; Conradty, Claudio; and Rittmann, Friedrich, 4,481,500, Cl. 373-93.000.
Conway, Harry E., to Westinghouse Electric Corp. Assembly for optical communication between high and low voltage component housings. 4,481,423, Cl. 250-551.000.
Cook, Gerald E.: *See*—
deMarco, Arthur P.; and Cook, Gerald E., 4,481,422, Cl. 250-459.100.
Cook, Gerald R.; and Mango, Phillip A., to Air Products and Chemicals, Inc. Vinyl acetate-ethylene binder composition having good wet tensile strength and low heat seal temperature for nonwoven products. 4,481,250, Cl. 428-290.000.
Coomer, Rufus: *See*—
DeFino, John M.; Coomer, Rufus; Stannard, John W.; and Voget, Gary G., 4,481,574, Cl. 364-200.000.
Cooper Industries, Inc.: *See*—
Ponziani, Louis Fiore, 4,480,514, Cl. 81-461.000.
Cooper, Kersi F.; and Drake, Jerry W., to Raytheon Company. Programmable read only memory. 4,481,263, Cl. 428-620.000.
Copal Company Limited: *See*—
Hayami, Tadao, 4,480,900, Cl. 354-234.100.
Coppelman, Maurice A., to Honeywell Information Systems Inc. Printed circuit board interconnection system. 4,480,885, Cl. 339-45.00M.
Coppus Engineering Corporation: *See*—
Flanagan, Paul; and Chumsae, Mark S., 4,480,790, Cl. 239-214.250.
Corning Glass Works: *See*—
Lock, William E.; and Peters, Donald C., 4,480,540, Cl. 101-36.000.
Marechal, Jean-Pierre; and Maschmeyer, Richard O., 4,481,023, Cl. 65-64.000.
Snyder, Edward A.; and Teter, Michael P., 4,481,563, Cl. 362-296.000.
Corvol, Pierre: *See*—
Cazaubon, Catherine; Diaz, Joseph; Guegan, Remy; Castro, Bernard; Evin, Genevieve; Corvol, Pierre; and Gagnol, Jean-Pierre, 4,481,192, Cl. 424-177.000.
Costa, Robert B., to RIS Irrigation Systems. Coupling. 4,480,856, Cl. 285-5.000.
Cotter, Byron R.: *See*—
Lin, Henry C.; and Cotter, Byron R., 4,481,370, Cl. 564-394.000.
Cottrell, Peter E.; and Geipel, Henry J., Jr., to International Business Machines Corporation. Simple process for making complementary transistors. 4,480,375, Cl. 29-576.00B.
Coulter Electronics, Inc.: *See*—
Roos, Ermi; and Talbert, Robert L., 4,481,466, Cl. 324-71.100.
Council for Mineral Technology: *See*—
Curr, Thomas R.; and Mooney, John F., 4,481,636, Cl. 373-18.000.
Courtaulds Limited: *See*—
Maxwell, Gordon W., 4,480,362, Cl. 26-28.000.
Coussan, Sidney G., to Daniel Industries, Inc. Gas lift mandrel. 4,480,686, Cl. 166-117.500.
Cox, Lloyd R.: *See*—
Beam, William D.; Chrisman, David C.; Cox, Lloyd R.; and Hankins, Charles R., 4,480,990, Cl. 432-9.000.
Crafon Medical AB: *See*—
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Crane, Leslie J.: *See*—
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Crawley, Michael W.: *See*—
Bailey, Joseph; Clarke, David; Crawley, Michael W.; Marsden, Peter D.; and Sidhu, Jasbir, 4,481,268, Cl. 430-17.000.
Credle, William S., Jr., to Coca-Cola Company, The. Fluid operated double acting diaphragm pump housing and method. 4,480,969, Cl. 417-393.000.
Crites, Robert C. Method for attaching furring adjacent to columns. 4,480,419, Cl. 52-741.000.
Crosby, Wayne H.; Fulger, Charles V.; Haas, Gerhard J.; and Nesheiwat, Donna M., to General Foods Corporation. Stabilized anthocyanin food colorant. 4,481,226, Cl. 426-540.000.
Crovatto, Richard C. Endodontic instrument for dental root canal filling. 4,480,996, Cl. 433-164.000.
Crowther, Gary J.: *See*—
Latte:y, William F., Jr.; and Crowther, Gary J., 4,480,926, Cl. 366-251.000.
Cucchetti, Celeste; and Cucchetti, Pietro, to O.R.M.A.C. S.p.A. dei F.LLI CUCCHETTI & CO. Device adapted to apply thermoplastic cement particularly for assembling shoe vamp sides. 4,480,584, Cl. 118-411.000.
Cucchetti, Pietro: *See*—
Cucchetti, Celeste; and Cucchetti, Pietro, 4,480,584, Cl. 118-411.000.
Cumberland Corporation: *See*—
Holladay, John H.; and Marlin, Robert V., 4,480,588, Cl. 119-17.000.
Cummins, Richard D. Button securing device. 4,480,357, Cl. 24-90.00R.
Curatolo, Benedict S.; and Coffey, Gerald P., to Standard Oil Company, The. Process and composition for lowering the reversible phase change temperature of nylon compositions. 4,481,354, Cl. 528-487.000.
Curr, Thomas R.; and Mooney, John F., to Council for Mineral Technology. Electrode assemblies for thermal plasma generating devices. 4,481,636, Cl. 373-18.000.
Curran, John W., to Exxon Production Research Co. Seismic surveying using shear waves. 4,481,612, Cl. 367-75.000.
Custom Packaging Systems, Inc.: *See*—
LaFleur, Arthur E.; and LaFleur, Lee, 4,481,006, Cl. 493-194.000.
D. L. Auld Company, The: *See*—
Bree, Charles E., 4,481,160, Cl. 264-135.000.
Daby, Larry E.: *See*—
Anderson, Nathaniel C.; Chesnut, Robert B.; and Daby, Larry E., 4,481,071, Cl. 156-656.000.
Dai Nippon Printing Co., Ltd.: *See*—
Obata, Hiroyuki; Takamizawa, Minoru; and Inoue, Yoshio, 4,481,282, Cl. 430-303.000.
Daidotokushuko Kabushikikaisha: *See*—
Suzuki, Seiji; Kawate, Kenji; and Tawara, Hiroshi, 4,480,777, Cl. 226-15.000.

Daigle, Louis L.: *See*—
Meyerand, Russell G., Jr.; Daigle, Louis L.; and Paine, Donald C., 4,481,456, Cl. 318-800.000.
Daikin Kogyo Co., Ltd.: *See*—
Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, 4,481,149, Cl. 260-465.00D.
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,480,684, Cl. 165-110.000.
Dailly, Christian; and Gomez, Daniel, to Arjomari-Prioux. Sheet products and preparation process thereof. 4,481,075, Cl. 162-145.000.
Daimler-Benz Aktiengesellschaft: *See*—
Konig, Werner, 4,480,498, Cl. 74-579.00R.
Resch, Reinhard, 4,480,877, Cl. 303-116.000.
d'Alayer de Costemore d'Arc, Stephane M., to Staar S. A. Cleaning device for razors. 4,480,387, Cl. 30-41.000.
DAMAS Maskinfabrik A/S: *See*—
Ewald, Ole, 4,480,754, Cl. 209-683.000.
Damco Testers, Inc.: *See*—
Miller, Darwin A., 4,480,462, Cl. 73-37.000.
Dana Corporation: *See*—
Kozerski, Richard J., 4,480,844, Cl. 277-235.00B.
Danchev, Panayot Y.: *See*—
Vassilev, Vassil B.; Sofiyanski, Vassil M.; Vassilev, Boris V.; Danchev, Panayot Y.; Angelov, Angel B.; Strandjaliev, Yordan M.; and Kehayov, Georgi S., 4,481,482, Cl. 330-297.000.
Dancy, H. Gordon, to Sonoco Products Company. Bag construction. 4,480,750, Cl. 206-554.000.
Daniel Industries, Inc.: *See*—
Coussan, Sidney G., 4,480,686, Cl. 166-117.500.
Daniel, John L.: *See*—
Peat, Robert W.; and Daniel, John L., 4,480,927, Cl. 366-299.000.
Daniels, Edward P., Jr., to Pitney Bowes Inc. Apparatus for providing interchangeable keyboard functions. 4,481,587, Cl. 364-466.000.
Daniels, Herbert E.; and Petersen, Vern R., to General Electric Company. X-Ray tube bias supply. 4,481,654, Cl. 378-110.000.
Darnell, Robert D.; Goetz, Carl A.; and Ingle, William M., to Motorola, Inc. Method of cooling a flange and coupling. 4,480,989, Cl. 432-1.000.
Data General Corp.: *See*—
Pilat, John F.; and Jones, Thomas M., 4,481,571, Cl. 364-200.000.
Datacopy Corporation: *See*—
Miller, Armin; and Merritt, Lauren V., 4,481,550, Cl. 360-77.000.
Davidkov, Peter I., deceased: *See*—
Petkov, Georgi K.; and Davidkov, Peter I., deceased, 4,480,453, Cl. 72-56.000.
Davidkova, Stefka H., executrix: *See*—
Petkov, Georgi K.; and Davidkov, Peter I., deceased, 4,480,453, Cl. 72-56.000.
Davies, Brian W.: *See*—
Tack, Robert D.; Lewtas, Kenneth; and Davies, Brian W., 4,481,013, Cl. 44-62.000.
Davies, Thomas J., Jr., to Fairchild Camera & Instrument Corp. Programmable output buffer. 4,481,432, Cl. 307-469.000.
Davis, Robert E., to Arkansas Patents, Inc. Pulsing combustion. 4,480,985, Cl. 431-1.000.
Davis, William: *See*—
Bertram, James L.; and Davis, William, 4,481,347, Cl. 528-102.000.
Davis, William J.: *See*—
Sasaki, Akira; and Davis, William J., 4,481,509, Cl. 340-728.000.
Dawes, Donald, to Scapa Inc. Spiral fabric papermakers felt formed from non-circular cross section yarns. 4,481,079, Cl. 162-348.000.
Dawson, Graham G.: *See*—
Wade, David W.; and Dawson, Graham G., 4,481,115, Cl. 210-727.000.
Dawson, N. Rick. Central smoke alarm and annunciator. 4,481,502, Cl. 340-516.000.
Deckers, Jan H., to Beondu A.G. Condensing boiler. 4,480,591, Cl. 122-14.000.
Deckner, George E., to Charles of the Ritz Group Ltd. Non-irritating cosmetic composition containing glucamine fatty acid emulsifier soap. 4,481,186, Cl. 424-59.000.
Deere & Company: *See*—
Ring, Curtis P., 4,480,963, Cl. 417-216.000.
De Fazio, Thomas L., to Charles Stark Draper Laboratory, Inc., The. Non-contact displacement sensing system for a compliance device. 4,480,918, Cl. 356-373.000.
DeFino, John M.; Coomer, Rufus; Stannard, John W.; and Voget, Gary G., to Pinetree Systems, Inc. Programmable interface between remote terminals and a computer. 4,481,574, Cl. 364-200.000.
DeFosse, Gerard: *See*—
Manoury, Philippe; Binet, Jean; and DeFosse, Gerard, 4,481,207, Cl. 424-267.000.
Deguchi, Hiroyuki: *See*—
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Degussa Aktiengesellschaft: *See*—
Baacke, Michael; and Kleinschmit, Peter, 4,481,174, Cl. 423-306.000.
von Bebenburg, Walter, deceased; and Siegfried, Pauluhn, 4,481,205, Cl. 424-263.000.
Dehne, Clarence A., to Jervis B. Webb Company. Conveyor chain and supporting bracket assembly. 4,480,743, Cl. 198-845.000.
Deike, Karl-Heinz: *See*—
Bergemann, Klaus-Dieter; Deike, Karl-Heinz; Kiel, Bernd-Joachim; and Konig, Heinz-Werner, 4,480,663, Cl. 137-627.500.
Deis, Daniel W.: *See*—
Young, Frederick J.; Hughes, William F.; Deis, Daniel W.; and McNab, Ian R., 4,480,523, Cl. 89-8.000.
de Kleijn, Albertus J., to U.S. Philips Corporation. Amplitude control system. 4,481,462, Cl. 323-274.000.
de Koning, Stephanus H.; and Smallenberg, Willem A. L., to U.S. Philips Corporation. Apparatus for driving one or more transducer units. 4,481,660, Cl. 381-58.000.
Delamare, Guy R., to Institut Francais du Petrole. Device for rapidly mooring a floating installation to an anchored marine installation. 4,480,575, Cl. 114-230.000.
Delaplane, John: *See*—
Huntzinger, Gerald O.; Butler, Raymond O., Jr.; Hetzler, Lewis R.; Delaplane, John; and Marks, Anthony L., 4,481,585, Cl. 364-424.000.
Del Monte, Lou A., to Honeywell Inc. Temperature control of solid state circuit chips. 4,481,403, Cl. 219-209.000.
DeLuca, Hector F.; Schnoes, Heinrich K.; Chu, John Y.; and Kabakoff, Bruce D., to Wisconsin Alumni Research Foundation. Vitamin D metabolism inhibitor. 4,481,198, Cl. 424-236.000.
deMarco, Arthur P.; and Cook, Gerald E., to United States of America, Army. Intrusion detecting camouflage fluorescent coating. 4,481,422, Cl. 250-459.100.
Demco Inc.: *See*—
Burns, Daniel E., 4,480,536, Cl. 100-6.000.
DeMuth, David L.: *See*—
Bowden, William L.; Barnette, Luverne H.; and DeMuth, David L., 4,481,267, Cl. 429-194.000.
Denka Chemical Corporation: *See*—
Banta, Edward M.; and Fitzgerald, Kenneth D., 4,481,313, Cl. 524-84.000.
Densetsukiki Industry Co., Ltd.: *See*—
Hiramatsu, Rihei; Takeshita, Ko; and Inoue, Tokunari, 4,481,461, Cl. 323-272.000.
Dergunova, Tatyana V.: *See*—
Grudinin, Vladimir P.; Bukhteev, Boris M.; and Dergunova, Tatyana V., 4,481,072, Cl. 162-16.000.
DeSoto, Inc.: *See*—
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,481,093, Cl. 204-159.190.
Desroziers, Andre J.: *See*—
Box, Stephen J. C.; Kovach, Ronald J.; and Desroziers, Andre J., 4,481,630, Cl. 372-38.000.
Deuman, Gerald J., Sr.; and Sannes, Norman, to Deuman, Gerald J., Sr. Self-storing door. 4,480,408, Cl. 49-254.000.
Deutsch, Allan S.; and Musikant, Barry L. Dental post and wrench therefor and method of restoring bulk to a tooth root therewith. 4,480,997, Cl. 433-221.000.
DeZubay, Egon A.; and Weeks, Kenneth D., to Westinghouse Electric Corp. Pulse cooled thermocouple system for high temperature measurement especially in combustion turbines. 4,480,930, Cl. 374-134.000.
Dhein, Rolf: *See*—
Hentschel, Karl-Heinz; Dhein, Rolf; Kussi, Siegfried; Winter, Hans; and Vojacek, Herbert, 4,481,123, Cl. 252-52.00R.
Diaz, Joseph: *See*—
Cazaubon, Catherine; Diaz, Joseph; Guegan, Remy; Castro, Bernard; Evin, Genevieve; Corvol, Pierre; and Gagnol, Jean-Pierre, 4,481,192, Cl. 424-177.000.
diDonato, Jose E. Bouncing toy. 4,480,400, Cl. 446-188.000.
Diehl GmbH & Co.: *See*—
Eckel, Alfred; Kastenhuber, Manfred; and Bock, Erich, 4,480,552, Cl. 102-393.000.
Diesel Kiki Co., Ltd.: *See*—
Ishizuka, Yutaka, 4,480,965, Cl. 417-274.000.
Ishizuka, Yutaka, 4,480,973, Cl. 418-150.000.
Kitano, Yuichi; and Tada, Yoshiharu, 4,481,452, Cl. 318-681.000.
Otani, Yoshio, 4,481,454, Cl. 318-696.000.
Dietrich, David E. Method of mixing fluids. 4,480,925, Cl. 366-107.000.
Dietrich, Rainer: *See*—
Campbell, Nicoll A. D.; Dyer, Henry B.; Dietrich, Rainer; Phaal, Cornelius; and Reid, Douglas J., 4,481,016, Cl. 51-295.000.
Di Franco, Enrico: *See*—
Lague, Gerald; Baldur, Roman; Marois, Paul; Brossard, Maurice; Quevillon, Marc; Di Franco, Enrico; and Dugre, Robert, 4,480,586, Cl. 119-15.000.
DiFrank, Frank J.; and Wallington, Fred L., to Owens-Illinois, Inc. Apparatus for heat-shrinking thermoplastic sleeves about glass containers. 4,480,984, Cl. 425-508.000.
DiGiacomo, Peter M., to Occidental Chemical Corporation. Process for removing chromate from solution. 4,481,087, Cl. 204-95.000.
Dinkel, Rolf; Roedel, Hilmar; and Grayson, James I., to Lonza Ltd. Process for the production of 3-picoline. 4,481,361, Cl. 546-251.000.
D'Innocenzio, Joseph: *See*—
Failla, Stephen J.; and D'Innocenzio, Joseph, 4,480,641, Cl. 128-326.000.
di Pietro, Raffaele; Paggini, Alberto; and Lagana', Vincenzo, to Snamprogetti S.p.A. Process for the production of a mixture of methanol and higher alcohols of "fuel grade". 4,481,012, Cl. 44-53.000.
Director General, Technical Research and Development Institute, (TRDI) The Defence Agency: *See*—
Koshoji, Yoshihiro; and Sato, Kenji, 4,480,817, Cl. 254-332.000.
Dischert, Robert A.: *See*—
Meise, William H.; and Dischert, Robert A., 4,481,539, Cl. 358-213.000.

Doble, Henry P., Jr.: *See*—
Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., 4,481,556, Cl. 361-222.000.

Dockner, Toni; Pommer, Ernst-Heinrich; and Wetzler, Matthias, to BASF Aktiengesellschaft. Microbiocidal substituted benzylimidazolium salts. 4,481,211, Cl. 424-273.00R.

Dodge, William G.: *See*—
Robinson, Samuel C.; Dodge, William G.; and Pollard, Roy E., 4,480,798, Cl. 242-18.00R.

Dodson, David L.; Pate, Bruce D.; and Rogers, Philip C., to Stauffer Chemical Company. Treatment for phosphorus-containing waste material. 4,481,176, Cl. 423-322.000.

Doljack, Frank A.: *See*—
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., 4,481,498, Cl. 338-20.000.

Dona, Marinus J. J.; Franken, Adrianus J. J.; and van der Giessen, Pieter, to U.S. Philips Corporation. Disc unit for information recording and/or reading system. 4,481,552, Cl. 360-97.000.

Doody, Brian C.: *See*—
Stokes, Paul W.; Doody, Brian C.; and Lill, Harold K., 4,481,407, Cl. 219-457.000.

Dorling, Rolf, to L. & C. Steinmuller GmbH. Arrangement for producing gaseous products. 4,481,014, Cl. 48-76.000.

Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia F., administrator, to Vsesojuzny Nauchho-Issledovatelsky Khimoko-Farmasevtichesky Institut Imeni S. Ordzhonikidze. Pharmaceutical composition containing N,N^3-di-(β-bromopropionyl)-N^1,N^2-dispirotripiperazinium dichloride. 4,481,201, Cl. 424-250.000.

dos Santos, Claudio: *See*—
McFarland, Archie R.; Middleton, Jack C.; and dos Santos, Claudio, 4,480,980, Cl. 425-131.100.

Dostoomian, Ashod S.: *See*—
Vanzetti, Riccardo; Dostoomian, Ashod S.; and Traub, Alan C., 4,481,418, Cl. 250-338.000.

Dotson, Ronald L.: *See*—
Moore, Sanders H.; and Dotson, Ronald L., 4,481,088, Cl. 204-98.000.

Doty, Gerald A., to Gateway Industries, Inc. Free-falling, self-locking adjustable tip assembly. 4,480,854, Cl. 280-801.000.

Doubt, Roark M., to Boeing Company, The. Method for brush plating conductive plastics. 4,481,081, Cl. 204-15.000.

Douglas, Claire R.: *See*—
Peterson, Edward D.; Godfrey, A. Dale; Douglas, Claire R.; and Pennington, Carl R., 4,480,639, Cl. 128-207.180.

Doulton Industrial Products Limited: *See*—
Alexander, Kevin; and Farr, Howard J., 4,480,681, Cl. 164-522.000.

Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V.: *See*—
van der Malen, Bernardus G. M., 4,481,169, Cl. 422-110.000.

Dow Chemical Company, The: *See*—
Bertram, James L.; and Davis, William, 4,481,347, Cl. 528-102.000.
Flores, David P.; and Allen, James A., 4,481,320, Cl. 524-239.000.
Ginter, Sally P.; and Hamlin, Percy J., 4,481,167, Cl. 422-29.000.
McIntyre, James A.; and Phillips, Robert F., 4,481,303, Cl. 502-159.000.

Downs, John D., to Shell Oil Company. Process for cell disruption. 4,481,294, Cl. 435-259.000.

Doyle, James: *See*—
Postle, Stephen R.; and Doyle, James, 4,481,252, Cl. 428-323.000.

Drach, Edward. Combination drain and cutting board. 4,480,343, Cl. 4-656.000.

Drackett Company, The: *See*—
Jones, Gregory R., 4,480,342, Cl. 4-228.000.
Richards, Randall G., 4,480,341, Cl. 4-228.000.

Dragisic, Joseph, to Allied Corporation. Tool and method for terminating electrical conductors in contact members. 4,480,385, Cl. 29-866.000.

Drake, Jerry W.: *See*—
Cooper, Kersi F.; and Drake, Jerry W., 4,481,263, Cl. 428-620.000.

Drexler, K. Eric: *See*—
Henson, H. Keith; and Drexler, K. Eric, 4,480,677, Cl. 164-46.000.

Dreyer, Heinz, to Amazonen-Werke H. Dreyer GmbH & Co. KG. Machine for applying pellets and powder. 4,480,948, Cl. 406-52.000.

Drust, Peter: *See*—
Kogler, Horst; and Drust, Peter, 4,480,471, Cl. 73-462.000.

Du Pont Canada, Inc.: *See*—
Fletcher, Eldon L., 4,481,242, Cl. 428-136.000.

Dubois, Jean C.; Gazard, Maryse; Schue, Francois; Giral, Louis; Rolland, Michel; and Aldissi, Mahmoud, to Thomson-CSF. High stability conductive polyacetylene material and process for the production thereof. 4,481,132, Cl. 252-519.000.

Duenkel, Gerald A.: *See*—
Kautz, Thomas O.; and Duenkel, Gerald A., 4,481,451, Cl. 318-628.000.

Duerr, John W., to General Motors Corporation. Two-cycle engine compressor. 4,480,968, Cl. 417-380.000.

Dugre, Robert: *See*—
Lague, Gerald; Baldur, Roman; Marois, Paul; Brossard, Maurice; Quevillon, Marc; Di Franco, Enrico; and Dugre, Robert, 4,480,586, Cl. 119-15.000.

Dukes, John N.; Bryson, Charles E., III; Weber, Lynn; and Morganthaler, Mark, to Hewlett-Packard Company. Fine positioning beam director system. 4,480,913, Cl. 356-319.000.

Duncan, James W., to Stencel Aero Engineering Corporation. Ejection seat stabilization apparatus. 4,480,806, Cl. 244-122.00A.

Dunn, Robert E., to Ferno-Washington, Inc. Break-away scoop stretcher. 4,480,345, Cl. 5-82.00R.

Du Pont de Nemours, E. I., and Company: *See*—
Adams, John E., 4,480,386, Cl. 29-874.000.
Beutel, Jacob; and LeStrange, Raymond J., 4,481,359, Cl. 546-114.000.
Hayes, Edwin H., 4,481,060, Cl. 156-309.900.
Levitt, George, 4,481,029, Cl. 71-93.000.
Tocker, Stanley, 4,481,215, Cl. 424-298.000.

Duracell Inc.: *See*—
Bowden, William L.; Barnette, Luverne H.; and DeMuth, David L., 4,481,267, Cl. 429-194.000.

Durand, Francois; and Smulders, Auguste, to Societe Anonyme Engrenages et Reducteurs, a part interest. Force limiting gear reducer for lifting pinion of self-elevating platform. 4,480,491, Cl. 74-411.000.

Dworsky, Lawrence N., to Motorola, Inc. Trapped energy resonator for oscillator and multiple resonator applications. 4,481,488, Cl. 331-158.000.

Dyer, Henry B.: *See*—
Campbell, Nicoll A. D.; Dyer, Henry B.; Dietrich, Rainer; Phaal, Cornelius; and Reid, Douglas J., 4,481,016, Cl. 51-295.000.

E.F. Houghton & Co.: *See*—
Holgado, Rosauro V., 4,481,125, Cl. 252-75.000.

E. R. Squibb & Sons, Inc.: *See*—
Kronauge, James F.; and Glavan, Kenneth A., 4,481,184, Cl. 424-1.100.
Varma, Ravi K., 4,481,144, Cl. 260-397.450.

E-W Mold & Tool Company, Inc.: *See*—
Grannen, Walter A., III, 4,481,161, Cl. 264-328.800.

Early, Judson H.: *See*—
Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., 4,481,067, Cl. 156-541.000.

Eastman Kodak Company: *See*—
Bailey, Joseph; Clarke, David; Crawley, Michael W.; Marsden, Peter D.; and Sidhu, Jasbir, 4,481,268, Cl. 430-17.000.
Bodem, George B.; and Michno, Drake M., 4,481,287, Cl. 430-483.000.
Evans, Steven, 4,481,141, Cl. 534-700.000.
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,481,238, Cl. 428-35.000.
Gasper, John, 4,481,414, Cl. 250-226.000.
McConnell, Richard L.; Joyner, Frederick B.; and Trotter, Jimmy R., 4,481,351, Cl. 528-272.000.
McConnell, Richard L.; Trotter, Jimmy R.; and Joyner, Frederick B., 4,481,352, Cl. 528-302.000.
Rule, Mark, 4,481,314, Cl. 524-88.000.
Titus, Rex S.; Kindt, Robert J.; and Peffer, Robert M., 4,480,906, Cl. 355-3.00R.

Eaton Corporation: *See*—
Janutka, William J., 4,481,434, Cl. 307-570.000.
Swedberg, N. Einar, 4,480,971, Cl. 418-61.00B.
Zumbusch, Steven J., 4,480,972, Cl. 418-61.00B.

Ebneth, Harold; Preis, Lothar; Giesecke, Henning; and Wolf, Gerhard D., to Bayer Aktiengesellschaft. Metallized carbon fibres and composite materials containing these fibres. 4,481,249, Cl. 428-288.000.

Eckel, Alfred; Kastenhuber, Manfred; and Bock, Erich, to Diehl GmbH & Co. Clustered ammunition ejectable from canisters. 4,480,552, Cl. 102-393.000.

Eckell, Albrecht; Eilingsfeld, Heinz; Elzer, Albert; Feichtmayr, Franz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, to BASF Aktiengesellschaft. Layered electrophotographic recording medium comprising heterocyclic nitrogen containing organic dye compounds. 4,481,272, Cl. 430-58.000.

Eckhardt, Richard A. Breakaway leafspring actuated keyswitch apparatus. 4,480,937, Cl. 400-479.000.

Eckner, Gunter, to Hoechst Aktiengesellschaft. Process for coating metallic substrates, and use of the products prepared in this process. 4,481,239, Cl. 428-36.000.

Edahiro, Takao: *See*—
Okamoto, Katsunari; Hosaka, Toshihito; Sasaki, Yutaka; Noda, Juichi; and Edahiro, Takao, 4,480,897, Cl. 350-96.300.

Edgar, Albert D.: *See*—
Bohrer, Kathryn A.; and Edgar, Albert D., 4,481,602, Cl. 364-900.000.

Edsbacker, Carl P. T., to Telefonaktiebolaget L M Ericsson. Method and apparatus for enabling the tracing of errors occuring in a series of transfers of binary message words. 4,481,582, Cl. 364-200.000.

Eggett, John G., to Trend Setter Products, Inc. Apparatus for cleaning lenses, mirrors and the like. 4,480,352, Cl. 15-214.000.

Eguchi, Shinsuke: *See*—
Fujioka, Kazuyoshi; and Eguchi, Shinsuke, 4,480,492, Cl. 74-467.000.

Eickmann, Karl. Fossil fuel combustion-steam engines and elements for fluid handling devices. 4,480,532, Cl. 92-144.000.

Eilingsfeld, Heinz: *See*—
Eckell, Albrecht; Eilingsfeld, Heinz; Elzer, Albert; Feichtmayr, Franz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,481,272, Cl. 430-58.000.

Eisai Co., Ltd.: *See*—
Tachibana, Shinro; Araki, Kengo; Ohya, Shizuko; and Yoshida, Seiji, 4,481,138, Cl. 260-112.50R.
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,481,217, Cl. 424-311.000.

Elder, Richard B.: *See—*
Fisher, Eldon M.; and Elder, Richard B., 4,481,433, Cl. 307-546.000.

Electrak International, Inc.: *See—*
Gillam, David R.; and Rolfe, John A., 4,481,388, Cl. 200-51.00R.

Electric Power Research Institute, Inc.: *See—*
Keim, Thomas A., 4,481,438, Cl. 310-201.000.

Electro Materials Corp. of America: *See—*
Johnson, Gary W.; Schoonejongen, Ronald J.; and Hilson, David G., II, 4,481,261, Cl. 428-434.000.

Electrolux Corporation: *See—*
Loforese, Leonard T., 4,481,435, Cl. 310-71.000.

Elkem a/s: *See—*
Evensen, Knut, 4,481,637, Cl. 373-97.000.
Halsor, Svein R.; and Storset, Magnar K., 4,480,928, Cl. 374-5.000.

Elliott, Michael W.: *See—*
Bolick, Virgil T., Jr.; Brownell, Kenneth W., Jr.; and Elliott, Michael W., 4,481,379, Cl. 174-36.000.

Ellison, Frank E.: *See—*
Mackowiak, Leonard S.; Ellison, Frank E.; Fidler, Jay W.; Tucker, N. George; and Varma, Gangdhar M. N., 4,481,010, Cl. 44-5.000.

Elmer, Stefan, to Schmid & Wezel, Firma. Compressed-air screwdriver with shutoff bypass means. 4,480,699, Cl. 173-12.000.

Elxsi: *See—*
Roberts, Allen W.; McFarland, Harold L., Jr.; and Lau, Harlan, 4,481,625, Cl. 370-85.000.

Elzer, Albert: *See—*
Eckell, Albrecht; Eilingsfeld, Heinz; Elzer, Albert; Feichtmayr, Franz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,481,272, Cl. 430-58.000.

Emery, John R.: *See—*
Emery, Roy W.; and Emery, John R., 4,480,781, Cl. 229-2.5EC.

Emery, Roy W.; and Emery, John R. Moulded egg carton with fingers for supporting the egg. 4,480,781, Cl. 229-2.5EC.

Enatsu, Masayuki, to Kabushiki Kaisha Medos Kenkyusho. Tonometer. 4,480,479, Cl. 73-729.000.

Endo, Satoru: *See—*
Yabe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, 4,481,003, Cl. 445-49.000.

Endoh, Hiromi; Uraki, Katsutoshi; and Miyamoto, Akira, to Fujitsu Limited. Wound foil type film capacitor. 4,481,558, Cl. 361-303.000.

Energy Conversion Devices, Inc.: *See—*
Gattuso, David A., 4,480,585, Cl. 118-719.000.

Enichem Elastomers Limited: *See—*
Timms, Donald G., 4,481,145, Cl. 260-405.600.

Environmental Elements Corp.: *See—*
Lowell, Philip S.; and Phillips, James L., 4,481,172, Cl. 423-242.000.

Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased (by Khiller, Ida I., administratrix.), to Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi SSR. 3-(2,2,2-Trimethylhydrazinium)propionate and method for the preparation and use thereof. 4,481,218, Cl. 424-316.000.

Eriksson, Sune, to SKF Steel Engineering AB. Manufacture of aluminium-silicon alloys. 4,481,031, Cl. 75-10.00R.

Esaki, Hiroshi; and Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Electroosmotic ink printer head. 4,481,520, Cl. 346-140.00R.

Escher Wyss Aktiengesellschaft: *See—*
Feldman, Hugo; and Guttinger, Heinz, 4,480,459, Cl. 72-243.000.

Espelage, Paul M.: *See—*
Zach, Franz C.; Bose, Bimal K.; Espelage, Paul M.; and Sicko, John S., 4,481,457, Cl. 318-803.000.

Etablissements Ruby: *See—*
Leroy, Louis, 4,480,516, Cl. 83-98.000.

Ethicon, Inc.: *See—*
Failla, Stephen J.; and D'Innocenzio, Joseph, 4,480,641, Cl. 128-326.000.

Ethyl Corporation: *See—*
Laran, Roy J., 4,481,182, Cl. 423-644.000.
Laran, Roy J., 4,481,183, Cl. 423-644.000.
Wolfram, Joachim W., 4,481,368, Cl. 562-406.000.
Wolfram, Joachim W., 4,481,369, Cl. 562-406.000.

ETS, Inc.: *See—*
Furlong, Dale A., 4,481,017, Cl. 55-12.000.

Etudes Techniques et Representations Industrielles E.T.R.I.: *See—*
Renaud, Andre ; and Chauviere, Henri, 4,481,436, Cl. 310-71.000.

Eue, Ludwig: *See—*
Forster, Heinz; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, 4,481,365, Cl. 556-422.000.

Eumurian, Gregoire; and Gadrault, Robert, to Thomson-CSF. Transmitter-receiver system for variable-rate digital data transmission via optical-fiber links. 4,481,676, Cl. 455-608.000.

Eusemann, Robert: *See—*
Koller, Manfred; Itzinger, Hermann; Handke, Gunther; Gottwalt, Karl; and Eusemann, Robert, 4,480,730, Cl. 188-315.000.

Evans, John M., to Beecham Group Limited. 4-Haloalkylamino substituted chromanol useful as antihypertensive agent. 4,481,213, Cl. 424-283.000.

Evans, John M., to Beecham Group p.l.c. 4-Acylaminobenzopyrans useful as anti-hypertensive agents. 4,481,214, Cl. 424-283.000.

Evans, Richard E., Jr.: *See—*
Kinney, William L., Jr.; and Evans, Richard E., Jr., 4,481,021, Cl. 55-290.000.

Evans, Steven, to Eastman Kodak Company. Nondiffusible yellow metallized azo dye-releasing compounds. 4,481,141, Cl. 534-700.000.

Evensen, Knut, to Elkem a/s. Arrangement of electrode holders. 4,481,637, Cl. 373-97.000.

Evers, Manfred, to Vereinigte Glaswerke GmbH. Glass pane framed by a U-shaped profile rail. 4,480,417, Cl. 52-400.000.

Evin, Genevieve: *See—*
Cazaubon, Catherine; Diaz, Joseph; Guegan, Remy; Castro, Bernard; Evin, Genevieve; Corvol, Pierre; and Gagnol, Jean-Pierre, 4,481,192, Cl. 424-177.000.

Ewald, Ole, to DAMAS Maskinfabrik A/S. Screening apparatus for grains, seeds or the like crops. 4,480,754, Cl. 209-683.000.

Exxon Corporation: *See—*
Bahler, Lawrence G., 4,481,593, Cl. 364-513.500.

Exxon Production Research Co.: *See—*
Curran, John W., 4,481,612, Cl. 367-75.000.

Exxon Research & Engineering Co.: *See—*
Canevari, Gerard P., 4,481,113, Cl. 210-680.000.
Lundberg, Robert D.; and Thaler, Warren A., 4,481,318, Cl. 524-211.000.
Newlove, John C.; Portnoy, Robert C.; Schulz, Donald N.; and Kitano, Kissho, 4,480,693, Cl. 166-293.000.
Tack, Robert D.; Lewtas, Kenneth; and Davies, Brian W., 4,481,013, Cl. 44-62.000.

Ezawa, Masayoshi; Misumi, Akira; Suzuki, Kenkichi; and Kumada, Masaharu, to Hitachi, Ltd. Photovoltaic-storage battery device. 4,481,265, Cl. 429-9.000.

Ezell, James J.; and Garin, Paul V., III, to A G Motor Corp. Swivel chair system. 4,480,867, Cl. 296-65.00R.

Fabriques d'Horlogerie de Fontainemelon S.A.: *See—*
Bolzt, Jean; and Calame, Jean-Pierre, 4,480,384, Cl. 29-840.000.

Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, to Eastman Kodak Company. Bonding compositions and shaped articles utilizing the bonding compositions. 4,481,238, Cl. 428-35.000.

Fahrrad-und Motorrad-Teilefabrik Im Haselbusch: *See—*
Schoch, Robert, 4,480,395, Cl. 36-50.000.

Failla, Stephen J.; and D'Innocenzio, Joseph, to Ethicon, Inc. Tip configuration for a ligating clip applier. 4,480,641, Cl. 128-326.000.

Fairchild Camera & Instrument Corp.: *See—*
Davies, Thomas J., Jr., 4,481,432, Cl. 307-469.000.
Houk, William R.; and Rao, Hayagriva V., 4,481,430, Cl. 307-296.00R.

Fan, Steve T., to General Mills, Inc. Dry mix for bread. 4,481,222, Cl. 426-62.000.

Fantone, Stephen D., to Polaroid Corporation. Optical and viewing system for stereoscopic photography. 4,480,893, Cl. 350-132.000.

Fanuc Ltd.: *See—*
Komiya, Hidetsugu, 4,481,588, Cl. 364-474.000.
Nozawa, Ryoichiro; and Kiya, Nobuyuki, 4,481,606, Cl. 364-900.000.

Farley Metals, Inc.: *See—*
Reeves, Dennis J., 4,480,698, Cl. 168-4.000.

Farr, Howard J.: *See—*
Alexander, Kevin; and Farr, Howard J., 4,480,681, Cl. 164-522.000.

Farrell, Daniel L. Solar energy apparatus. 4,480,633, Cl. 126-417.000.

Farrow, Charles T. Apparatus and method for laying pipe. 4,480,942, Cl. 405-154.000.

Faure, Andre , to Societe Anonyme Dite: Aubert & Duval. Method for chromizing metallic pieces such as steel pieces and chromized metallic pieces obtained thereby. 4,481,264, Cl. 428-627.000.

Feichtinger, Gerhard: *See—*
Skatsche, Othmar; and Feichtinger, Gerhard, 4,480,601, Cl. 123-59.00B.

Feichtmayr, Franz: *See—*
Eckell, Albrecht; Eilingsfeld, Heinz; Elzer, Albert; Feichtmayr, Franz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,481,272, Cl. 430-58.000.

Feldman, Hugo; and Guttinger, Heinz, to Escher Wyss Aktiengesellschaft. Rolling mill. 4,480,459, Cl. 72-243.000.

Feldmuhle Aktiengesellschaft: *See—*
Kraft, Harald; and Leimanis, Peter, 4,480,950, Cl. 407-103.000.

Fellows, Mark W.: *See—*
Stupp, Edward H.; and Fellows, Mark W., 4,481,447, Cl. 315-101.000.

Ferguson, Malcolm J. Self-closing gate. 4,480,405, Cl. 49-131.000.

Fernandez de Castro, Aurora; and Neff, Jerry L., to TechAmerica Group, Inc. Stabilized polyacrylamide gels and system for SDS electrophoresis. 4,481,094, Cl. 204-180.00G.

Ferno-Washington, Inc.: *See—*
Dunn, Robert E., 4,480,345, Cl. 5-82.00R.

Ferranti, PLC: *See—*
Bishop, Malcolm J., 4,481,448, Cl. 318-248.000.

Ferrieu, Gilbert M. M., to U.S. Philips Corporation. Current mirror circuit. 4,481,463, Cl. 323-315.000.

Fichtel & Sachs AG: *See—*
Koller, Manfred; Itzinger, Hermann; Handke, Gunther; Gottwalt, Karl; and Eusemann, Robert, 4,480,730, Cl. 188-315.000.

Fidler, Jay W.: *See—*
Mackowiak, Leonard S.; Ellison, Frank E.; Fidler, Jay W.; Tucker, N. George; and Varma, Gangdhar M. N., 4,481,010, Cl. 44-5.000.

Fieldcrest Mills, Inc.: *See—*
Hawkins, Jeanette C.; Sella, Nancy W.; and Bradford, Carl D., 4,480,346, Cl. 5-490.000.
Hawkins, Jeanette C.; Sella, Nancy W.; and Bradford, Carl D., 4,480,347, Cl. 5-490.000.

Fields, Craig I. Interactive videodisc training system with bar code access. 4,481,412, Cl. 235-472.000.

Finn, Everett N.: *See*—
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., 4,480,982, Cl. 425-385.000.

Finsterwalder, Ulrich. Tension-band bridge. 4,480,348, Cl. 14-18.000.

Firey, Joseph C. Multipressure compressor. 4,480,654, Cl. 137-119.000.

Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. High-production rotary offset printing machine. 4,480,544, Cl. 101-177.000.

Fisher, Eldon M.; and Elder, Richard B., to RCA Corporation. Voltage clamp circuit utilizing an active device. 4,481,433, Cl. 307-546.000.

Fisher, Franklin D.; and Clark, Kenneth W. Bracket for attaching demountable parts to vehicles and the like. 4,480,578, Cl. 114-344.000.

Fitzgerald, Kenneth D.: *See*—
Banta, Edward M.; and Fitzgerald, Kenneth D., 4,481,313, Cl. 524-84.000.

Fives-Cail Babcock: *See*—
Cazaux, Joel; and Pietryka, Joseph, 4,480,678, Cl. 164-416.000.

Flanagan, Paul; and Chumsae, Mark S., to Coppus Engineering Corporation. Rotary burner. 4,480,790, Cl. 239-214.250.

Flecknoe-Brown, Anthony E.: *See*—
Keith, Donald G.; and Flecknoe-Brown, Anthony E., 4,480,979, Cl. 425-403.000.

Fleischer, Dietrich; Weber, Eckhard; and Brandrup, Johannes, to Hoechst Aktiengesellschaft. Thermoplastic compositions comprising vinyl chloride polymer, CLPE and fluoropolymer. 4,481,333, Cl. 525-192.000.

Fleming, Paul D., to W & F Manufacturing, Inc.; and Peachtree Doors, Inc. Latching and locking mechanism for sliding door. 4,480,862, Cl. 292-162.000.

Fletcher, Eldon L., to Du Pont Canada, Inc. Aquatic weed barrier. 4,481,242, Cl. 428-136.000.

Flink, John A.; and Vinn, Charles L., to Raytheon Company. Differential amplifier having a compensation current injection selector network. 4,481,478, Cl. 330-253.000.

Flink, Leslie R.; Fox, Bryce J.; and Witzel, Mary K., to Minnesota Mining and Manufacturing Company. Vapor recovery method and apparatus. 4,480,393, Cl. 34-27.000.

Florek, Florian F. Orthopaedic appliance for use in treating fractured clavicles. 4,480,637, Cl. 128-94.000.

Flores, David P.; and Allen, James A., to Dow Chemical Company, The. Method for reducing block of ethylene interpolymers containing —COOH groups. 4,481,320, Cl. 524-239.000.

Flynn, John J.: *See*—
Chai, Bruce H.; Buehler, Ernest; and Flynn, John J., 4,481,069, Cl. 156-623.00R.

Foell, Helmut; Freienstein, Bernhard; Geim, Karl; Grabmaier, Josef; and Hintringer, Otmar, to Siemens Aktiengesellschaft. Apparatus and method for manufacturing tape-shaped silicon bodies for solar cells. 4,481,235, Cl. 427-74.000.

Foelsch, Donald H.: *See*—
Girard, Theodore A.; and Foelsch, Donald H., 4,481,038, Cl. 106-271.000.

Folkers, Karl; and Jie-cheng, Xu, to Board of Regents, The University of Texas System. Peptide antagonists of substance P. 4,481,139, Cl. 260-112.50R.

FoodCraft Equipment Co., Inc.: *See*—
Martin, Eugene G.; Martin, Harold C.; and Risser, Dale M., 4,480,353, Cl. 17-11.000.

Ford, Earl M.: *See*—
Shafer, James E.; and Ford, Earl M., 4,480,555, Cl. 105-199.00R.

Ford Motor Company: *See*—
Gable, Melvin G.; and Sherman, Richard H., 4,481,641, Cl. 375-7.000.
Rumpel, Manfred, 4,480,852, Cl. 280-663.000.

Foresta, Anthony J.; and Tarara, James A., to Clamp-All Corp. Transition coupling and clamp assembly containing same. 4,480,860, Cl. 285-177.000.

Formanek, Frank J.: *See*—
Schukei, Glen E.; Formanek, Frank J.; and Graf, Donald V., 4,480,841, Cl. 277-1.000.

Forsgren, Roland: *See*—
Blomqvist, Ake; and Forsgren, Roland, 4,480,524, Cl. 89-41.00M.

Forson, Henry M., to AT&T Bell Laboratories. Method of operating a computer system to provide customized responses. 4,481,577, Cl. 364-200.000.

Forster, Heinz; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Trifluoromethyl-phenoxy-phenyl-silicon derivatives, processes for their preparation, and their use as herbicides and plant-growth regulators. 4,481,365, Cl. 556-422.000.

Forsterling, Robert B., to General Motors Corporation. Life extension of catalyst predip baths. 4,481,236, Cl. 427-97.000.

Fosroc International Limited: *See*—
Beale, James; and Viles, Robert F., 4,481,037, Cl. 106-104.000.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See*—
Watanabe, Kiyoshi, 4,481,045, Cl. 148-101.000.

Fox, Bryce J.: *See*—
Flink, Leslie R.; Fox, Bryce J.; and Witzel, Mary K., 4,480,393, Cl. 34-27.000.

Fox, Eldred A. Dump bed stabilizer. 4,480,871, Cl. 298-22.00J.

Foxboro Company, The: *See*—
Thompson, Duane T.; Karas, Edwin L.; Root, Ernest F.; and Schlyter, Fredrik, 4,480,914, Cl. 356-346.000.

Fraige, Richard. Buoyant fiber product and method of manufacturing same. 4,481,248, Cl. 428-283.000.

Franey, Terence E.; Watkins, Richard B.; and Woolfolk, Austin W., to International Business Machines Corporation. Radiation hardened transfer medium. 4,481,255, Cl. 428-355.000.

Frania, Josef: *See*—
Mylius, Horst; Frania, Josef; and Ristic, Momcilo, 4,480,531, Cl. 92-29.000.

Frank, Larry D., to Schlumberger Technology Corporation. Safety enhancement device for well-logging cable sheave wheels. 4,480,818, Cl. 254-411.000.

Frank, Wilhelm, to Wilh. Frank GmbH. Skylight. 4,480,406, Cl. 49-153.000.

Franken, Adrianus J. J.: *See*—
Dona, Marinus J. J.; Franken, Adrianus J. J.; and van der Giessen, Pieter, 4,481,552, Cl. 360-97.000.

Fredericks, George E.; and Preschern, Horst, to List, Hans. Capacitive measuring transducer. 4,481,465, Cl. 324-60.0CD.

Freeburg, Thomas A., to Motorola, Inc. Method and apparatus for dynamically selecting transmitters for communications between a primary station and remote stations of a data communications system. 4,481,670, Cl. 455-33.000.

Freeman, Gary M.: *See*—
Harter, James R.; and Freeman, Gary M., 4,480,467, Cl. 73-204.000.

Freienstein, Bernhard: *See*—
Foell, Helmut; Freienstein, Bernhard; Geim, Karl; Grabmaier, Josef; and Hintringer, Otmar, 4,481,235, Cl. 427-74.000.

Freitag, Dieter: *See*—
Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, 4,481,350, Cl. 528-167.000.
Serini, Volker; Nouvertne, Werner; and Freitag, Dieter, 4,481,338, Cl. 525-394.000.

Frendreis, James A.: *See*—
Harbst, John W.; and Frendreis, James A., 4,480,565, Cl. 112-281.000.

Frentzel, Richard L., to Celotex Corporation, The. Polyoxyalkylene/unsaturated diester reaction product for cellular foam stabilization. 4,481,307, Cl. 521-115.000.

Fried. Krupp GmbH: *See*—
Katschinski, Ulrich, 4,480,679, Cl. 164-420.000.

Frigoscandia Contracting AB: *See*—
Jaxmar, Leif; and Alfred, Allan, 4,480,535, Cl. 99-476.000.

Frissora Anthony P.; and Saunders, Ralph R., to Allied Corporation. Apparatus and method for aligning an object with respect to top-dead center of a wheel. 4,480,390, Cl. 33-286.000.

Frohwerk, Paul A., to Ceramic Cooling Tower Company. Multi-cell tiles with openings for use in a liquid cooling tower. 4,481,155, Cl. 261-94.000.

Frushtick, Leonard, to Leonard Automatics, Inc. Trouser press with trouser inflator and waste heat reclaimer. 4,480,398, Cl. 38-42.000.

Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrimido-2-benzazepines. 4,481,142, Cl. 260-243.300.

Fuji Electric Company, Ltd.: *See*—
Takagi, Toshio; Iwanami, Masao; and Sumikawa, Teruaki, 4,480,764, Cl. 221-11.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Takano, Toshio; and Kobayashi, Toshio, 4,480,505, Cl. 74-869.000.
Takano, Toshio, 4,480,732, Cl. 192-0.052.
Yamakawa, Toru, 4,480,612, Cl. 123-198.00F.

Fuji Photo Film Co., Ltd.: *See*—
Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, 4,481,231, Cl. 427-44.000.
Ishikawa, Hiromi, 4,480,892, Cl. 350-3.710.
Ishikawa, Shun-ichi; Tamoto, Koji; Iwasaki, Masayuki; and Umehara, Akira, 4,481,276, Cl. 430-281.000.
Kishimoto, Shinzo; and Yamamuro, Kiyohiko, 4,481,290, Cl. 430-543.000.
Matsufuji, Akihiro; Umemura, Shizuo; Kasuga, Akira; Miyatuka, Hajime; and Akashi, Goro, 4,481,253, Cl. 428-323.000.
Ogawa, Masashi; Ishigaki, Kunio; Iwasaki, Nobuyuki; and Nakamura, Taku, 4,481,284, Cl. 430-355.000.
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, 4,481,285, Cl. 430-410.000.
Tanaka, Yasunori; and Noda, Shinji, 4,480,583, Cl. 118-410.000.

Fuji Xerox Co., Ltd.: *See*—
Inui, Toshiharu; Moriguchi, Fujio; and Ohmori, Takashi, 4,481,518, Cl. 346-76.0PH.
Yoshino, Masaki, 4,480,905, Cl. 355-3.0DD.

Fujii, Etsuo: *See*—
Sato, Makoto; Miyakawa, Yoshitaka; Fujii, Etsuo; and Matsuda, Shohei, 4,480,876, Cl. 303-103.000.

Fujii, Masaki; and Miyabayashi, Mitsutaka, to Mitsubishi Petrochemical Company Limited. Olefinic block copolymers of ethylene propylene and 1-butene. 4,481,336, Cl. 525-323.000.

Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, to Taiho Pharmaceutical Company, Limited. Composition containing 1-(n-hexylcarbamoyl)-5-fluorouracil and uracil. 4,481,203, Cl. 424-251.000.

Fujii, Shigeharu: *See*—
Takahashi, Katsuji; Fujii, Shigeharu; and Sagara, Makoto, 4,480,366, Cl. 29-26.00A.

Fujii, Yasuhiko, to Victor Company of Japan, Limited. Method and system for producing a synchronous signal from cyclic-redundancy-coded digital data blocks. 4,481,648, Cl. 375-119.000.

Fujikawa, Junichi; and Taniguchi, Masaharu, to Toray Industries, Inc. Photosensitive polyamide resin composition. 4,481,280, Cl. 430-281.000.

Fujikin International, Inc.: *See*—
Komatsu, Shiro, 4,480,866, Cl. 296-21.000.

Fujikura Ltd.: *See*—
Togawa, Tsuyoshi; Nakamoto, Teruyuki; Iwata, Mitsuo; Ito, Katuhiko; Sano, Hideo; Sekine, Nobutaka; and Shibuya, Tomoe, 4,480,981, Cl. 425-143.000.

Fujimori, Tohru, to Sony Corporation. Bearing device. 4,480,881, Cl. 308-189.00A.

Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, to Canon Kabushiki Kaisha. Camera capable of switching between manual exposure control and shutter priority automatic exposure control. 4,480,903, Cl. 354-465.000.

Fujioka, Kazuyoshi; and Eguchi, Shinsuke, to Nissan Motor Company, Limited. Lubrication conduit in a pinion gear carriage for automatic transmission. 4,480,492, Cl. 74-467.000.

Fujisawa, Nobuhiko; Tanibe, Shozo; and Hujiki, Tatsunori, to Ryobi Ltd. Offset press having two printing units with alternate path delivery cylinders. 4,480,545, Cl. 101-183.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,481,196, Cl. 424-180.000.

Fujitsu Fanuc Limited: *See*—
Inaba, Hajimu; Ono, Yukio; and Hiraizumi, Mitsuo, 4,481,568, Cl. 364-167.000.

Fujitsu Limited: *See*—
Endoh, Hiromi; Uraki, Katsutoshi; and Miyamoto, Akira, 4,481,558, Cl. 361-303.000.
Higuchi, Mitsuo; and Takeuchi, Atsushi, 4,481,609, Cl. 365-72.000.
Miyasaka, Kiyoshi, 4,481,526, Cl. 357-84.000.
Naito, Jiro; Yoneda, Yasuhiro; and Kitamura, Kenroh, 4,481,279, Cl. 430-280.000.
Osaka, Fukunobu; and Shirai, Tatsunori, 4,481,523, Cl. 357-30.000.
Suzuki, Hirokazu; and Akiyama, Takehiro, 4,481,427, Cl. 307-200.00A.
Takemae, Yoshihiro; and Miyahara, Hatsuo, 4,481,610, Cl. 365-182.000.

Fujiwara, Kazuo; Sugie, Kiyoshi; and Uetani, Fujiko, to Kabushiki Kaisha Kobe Seiko Sho. High Mn-Cr non-magnetic steel. 4,481,033, Cl. 75-128.00A.

Fujiya, Toshimichi. Door lock unlockable from indoor side. 4,480,451, Cl. 70-92.000.

Fukagai, Toshio: *See*—
Hashimoto, Mitsuru; Sakai, Kiyoshi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, legal representative, 4,481,271, Cl. 430-57.000.

Fukunaga, Yasushi; Bandoh, Tadaaki; Matsumoto, Hidekazu; Hiraoka, Ryosei; Ide, Jushi; Kato, Takeshi; and Kawakami, Tetsuya, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Shared virtual address translation unit for a multiprocessor system. 4,481,573, Cl. 364-200.000.

Fukushima, Nobuo; Nakae, Kiyohiko; and Terazawa, Takayuki, to Sumitomo Chemical Company, Limited. Agricultural plastic film. 4,481,254, Cl. 428-329.000.

Fulger, Charles V.: *See*—
Crosby, Wayne H.; Fulger, Charles V.; Haas, Gerhard J.; and Nesheiwat, Donna M., 4,481,226, Cl. 426-540.000.

Fuma, Kazunari: *See*—
Iwase, Takatoshi; Fuma, Kazunari; Nakagawa, Akira; and Hakamada, Kouhei, 4,480,456, Cl. 72-185.000.

Furlong, Dale A., to ETS, Inc. Electrical precipitation apparatus and method. 4,481,017, Cl. 55-12.000.

Furnas, Michael W.: *See*—
Lee, Lawrence C.; Tyagi, Mukul K.; Furnas, Michael W.; and Traylor, Francis T., 4,481,020, Cl. 55-203.000.

Furukawa, Takao, to Kabushiki Kaisha Furukawa Seisakusho. Vacuum packaging apparatus. 4,480,425, Cl. 53-509.000.

Furusawa, Choji: *See*—
Ishikawa, Norikatsu; and Furusawa, Choji, 4,480,734, Cl. 192-20.000.

Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M. Air seeder distributor. 4,480,794, Cl. 239-654.000.

Fuss, Eric W.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,480,794, Cl. 239-654.000.

Fuss, Jarvis R.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,480,794, Cl. 239-654.000.

Fuss, Roy M.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,480,794, Cl. 239-654.000.

Fussl, Erwin, to Maerz Ofenbau AG. Process of and apparatus for operating a shaft furnace. 4,480,991, Cl. 432-14.000.

Futterer, Klaus-Jurgen, to Grapha-Holding AG. Apparatus for trimming the marginal portions of paper sheets or the like. 4,480,518, Cl. 83-508.000.

G. Siempelkamp GmbH & Co.: *See*—
Gerhardt, Klaus, 4,480,978, Cl. 425-371.000.

GA Technologies Inc.: *See*—
Norman, John H., 4,481,181, Cl. 423-573.00G.

Gable, Melvin G.; and Sherman, Richard H., to Ford Motor Company. Coaxial cable tap coupler for a data transceiver. 4,481,641, Cl. 375-7.000.

Gadrault, Robert: *See*—
Eumurian, Gregoire; and Gadrault, Robert, 4,481,676, Cl. 455-608.000.

Gagelin, Jean-Jacques: *See*—
Allemand, Robert; Gagelin, Jean-Jacques; and Tournier, Edmond, 4,481,420, Cl. 250-385.000.

Gagnol, Jean-Pierre: *See*—
Cazaubon, Catherine; Diaz, Joseph; Guegan, Remy; Castro, Bernard; Evin, Genevieve; Corvol, Pierre; and Gagnol, Jean-Pierre, 4,481,192, Cl. 424-177.000.

Gall, Martin; and Palmer, John R., to Upjohn Company, The. 4H-1,2,4-Triazol-3-yl compounds. 4,481,360, Cl. 546-210.000.

Gallois, Daniel: *See*—
Goldaniga Rene F.; Walter, Geard; Walter G. W.; Glotin, Bernard J. P.; and Gallois, Daniel, 4,480,697, Cl. 166-372.000.

Gargos, Gary. Boat powered by sea waves. 4,481,002, Cl. 440-9.000.

Garin, Paul V., III: *See*—
Ezell, James J.; and Garin, Paul V., III, 4,480,867, Cl. 296-65.00R.

Garrels, Wilbur D. Hydraulic system valve. 4,480,662, Cl. 137-625.230.

Garrett, William R., to Smith International, Inc. Drilling head. 4,480,703, Cl. 175-195.000.

Gaset, Antoine: *See*—
Kalk, Philippe; Poilblanc, Rene ; and Gaset, Antoine, 4,481,375, Cl. 568-454.000.

Gasper, John, to Eastman Kodak Company. Light collection apparatus for a scanner. 4,481,414, Cl. 250-226.000.

Gates, Wendall C. Apparatus and method for determining liquid flow-rate. 4,480,466, Cl. 73-195.000.

Gateway Industries, Inc.: *See*—
Doty, Gerald A., 4,480,854, Cl. 280-801.000.

Gattuso, David A., to Energy Conversion Devices, Inc. External isolation module. 4,480,585, Cl. 118-719.000.

Gauge, Paul D., to Centre National d'Etudes Spatiales. Unfoldable device for extending the nozzle of a rocket engine. 4,480,437, Cl. 60-271.000.

Gay, Eric L.: *See*—
Berke, Joseph J.; Gay, Eric L.; and Doble, Henry P., Jr., 4,481,556, Cl. 361-222.000.

Gazard, Maryse: *See*—
Dubois, Jean C.; Gazard, Maryse; Schue, Francois; Giral, Louis; Rolland, Michel; and Aldissi, Mahmoud, 4,481,132, Cl. 252-519.000.

Gebr. Hofmann GmbH & Co. Kg, Maschinenfabrik: *See*—
Kogler, Horst; and Drust, Peter, 4,480,471, Cl. 73-462.000.

Geelhood, Bruce D.: *See*—
Young, Charles A.; and Geelhood, Bruce D., 4,481,421, Cl. 250-390.000.

Gehring, Gerhard, to Siemens Aktiengesellschaft. Negative-feedback circuit for an, especially integrated, transistor amplifier. 4,481,479, Cl. 330-265.000.

Geim, Karl: *See*—
Foell, Helmut; Freienstein, Bernhard; Geim, Karl; Grabmaier, Josef; and Hintringer, Otmar, 4,481,235, Cl. 427-74.000.

Geipel, Henry J., Jr.: *See*—
Cottrell, Peter E.; and Geipel, Henry J., Jr., 4,480,375, Cl. 29-576.00B.

Gema, S.A.: *See*—
Palomo-Coll, Alberto; and Palomo-Coll, Antonio L., 4,481,357, Cl. 544-016.000.

General Dynamics, Pomona Division: *See*—
Piesik, Edward T., 4,480,522, Cl. 89-1.819.

General Electric Company: *See*—
Annis, Jeffrey R.; and Gowda, Srinivasa R., 4,481,655, Cl. 378-125.000.
Bolon, Donald A., 4,481,339, Cl. 525-424.000.
Daniels, Herbert E.; and Petersen, Vern R., 4,481,654, Cl. 378-110.000.
Giles, Harold F., Jr., 4,481,325, Cl. 524-320.000.
Heft, Eldon B.; and Klein, Keith W., 4,481,491, Cl. 335-21.000.
Kray, William D., 4,481,178, Cl. 423-342.000.
Maclin, Harvey M., 4,480,436, Cl. 60-39.320.
Morton, James W., 4,481,063, Cl. 156-349.000.
Owen, Louis L.; Horujko, Mark P.; and Bools, William G., 4,481,553, Cl. 361-93.000.
Patel, Manubhai M.; and Carreno, Diether E., 4,480,957, Cl. 416-220.00R.
Rabatin, Jacob G., 4,481,416, Cl. 250-327.200.
Smith, Peter H., 4,481,409, Cl. 219-518.000.
Stokes, Vijay K., 4,481,439, Cl. 310-233.000.
Thomas, Charles E.; and Wojnarowski, Robert J., 4,481,404, Cl. 219-398.000.
White, Robert W.; and Kuzan, Frank R., 4,480,378, Cl. 29-596.000.
Zach, Franz C.; Bose, Bimal K.; Espelage, Paul M.; and Sicko, John S., 4,481,457, Cl. 318-803.000.

General Electric Company, P.l.c., The: *See*—
Read, Eileen; and McCaughan, Daniel V., 4,480,488, Cl. 73-862.680.

General Foods Corporation: *See*—
Crosby, Wayne H.; Fulger, Charles V.; Haas, Gerhard J.; and Nesheiwat, Donna M., 4,481,226, Cl. 426-540.000.
Hinman, David C.; and Saleeb, Fouad Z., 4,481,223, Cl. 426-422.000.

General Mills, Inc.: *See*—
Fan, Steve T., 4,481,222, Cl. 426-62.000.

General Motors Corporation: *See*—
Bailey, Keith A.; and Spurlin, Stephen F., 4,480,728, Cl. 188-271.000.
Duerr, John W., 4,480,968, Cl. 417-380.000.
Forsterling, Robert B., 4,481,236, Cl. 427-97.000.
Gill, Lloyd T., 4,480,600, Cl. 123-52.0MV.
Hoffman, Charles T., Jr., 4,480,724, Cl. 188-73.450.
House, Ronnalee; and Kellams, Roger W., 4,480,377, Cl. 29-593.000.
Huntzinger, Gerald O.; Butler, Raymond O., Jr.; Hetzler, Lewis R.; Delaplane, John; and Marks, Anthony L., 4,481,585, Cl. 364-424.000.
Siewert, Robert M., 4,480,613, Cl. 123-298.000.
Skinner, Timothy J., 4,480,964, Cl. 417-222.000.
Tsai, Lung-Wen; and Jacques, Robert L., 4,480,607, Cl. 123-192.00B.
Varterasian, John H., 4,480,473, Cl. 73-596.000.
Gentilman, Richard L.: *See*—
Hartnett, Thomas M.; Gentilman, Richard L.; and Maguire, Edward A., 4,481,300, Cl. 501-98.000.
Geo Vann, Inc.: *See*—
Vann, Roy R., 4,480,690, Cl. 166-250.000.
Geoghegan, Robert J.: *See*—
Milosh, Michael D.; and Geoghegan, Robert J., 4,480,666, Cl. 144-194.000.
George, Kurudamannil A.: *See*—
Baran, Stanley J.; Van Camp, John; and George, Kurudamannil A., 4,481,171, Cl. 422-176.000.
Georgiev, Georgi D. Bicycle. 4,480,848, Cl. 280-281.0LP.
Georlette, Pierre; and Maquet, Nestor, to Solvay & Cie (Societe Anonyme). Extrusion of films of vinylidene fluoride polymers. 4,481,158, Cl. 264-22.000.
Gerhards, Hans D.: *See*—
Zacharias, Theodor; Gerhards, Hans D.; and Staat, Karlhans, 4,480,515, Cl. 83-81.000.
Gerhardt, Klaus, to G. Siempelkamp GmbH & Co. Press for the production of pressedboard. 4,480,978, Cl. 425-371.000.
Gerndt, Robert J., to Kimberly-Clark Corporation. Sleeve making method and apparatus. 4,480,772, Cl. 223-1.000.
Gerrit, Woudstra, to N.V. Nederlandse Gasunie. Device for measurement of the potential with respect to the soil of a cathodically protected metallic structure. 4,481,474, Cl. 324-425.000.
Gerritsen, Jan, to U.S. Philips Corporation. Picture display device comprising a picture display tube and a circuit for feeding the heater thereof. 4,481,476, Cl. 328-270.000.
Geskin, Ernest S. Steel making method. 4,480,373, Cl. 29-527.300.
Getz, Edward H.; and Ott, Clarence R., Jr., to Whirlpool Corporation. Automatic liquid level control for automatic washers. 4,480,449, Cl. 68-12.00R.
Gewerkschaft Eisenhutte Westfalia: *See*—
Collet, Erwin; and Loweg, Heribert, 4,480,381, Cl. 29-746.000.
Gianzero, Stanley, to Schlumberger Technology Corporation. Pulsed induction logging for determining conductivity and invaded zone properties. 4,481,472, Cl. 324-339.000.
Gibson, Edwin D.: *See*—
Schmidt, Frederick A.; Verhoeven, John D.; and Gibson, Edwin D., 4,481,030, Cl. 75-10.00C.
Giebel, Gerhard, to USM Corporation. Heel nailing machine. 4,480,778, Cl. 227-40.000.
Gieldanowski, Siegfried: *See*—
Tesch, Gunter; and Gieldanowski, Siegfried, 4,481,247, Cl. 428-234.000.
Giesecke, Henning: *See*—
Ebneth, Harold; Preis, Lothar; Giesecke, Henning; and Wolf, Gerhard D., 4,481,249, Cl. 428-288.000.
Giesselmann, Ewald; and Munch, Ulrich, to Sanol Schwarz GmbH. Water-soluble composition for forming an aqueous isotonic nitroglycerine solution and the nitroglycerine solution formed. 4,481,220, Cl. 424-349.000.
Gilb, Tyrell T.; and Commins, Alfred D., to Simpson Strong-Tie Company, Inc. Double shear angled fastener connector. 4,480,941, Cl. 403-232.100.
Gilbertson, Gordon E. Shaft coupler. 4,480,428, Cl. 54-69.000.
Gilbertson, Terry J., to Upjohn Company, The. Diene adducts with triazoline diones. 4,481,356, Cl. 548-264.000.
Gilbertson, Thomas A. Oil well pump driving unit. 4,480,685, Cl. 166-68.500.
Gilbride, Andrew J.: *See*—
Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Martin, John F., 4,480,581, Cl. 118-50.000.
Giles, Harold F., Jr., to General Electric Company. Polyalkylenelactone modified polyetherimides. 4,481,325, Cl. 524-320.000.
Gilham, Dennis T.; Williams, Thomas D.; Ananthan, Manickam; and Herring, William J., to Roneo Alcatel Limited. Postal meter using microcomputer scanning of encoding switches for simultaneous setting of electronic accounting & mechanical printing systems. 4,481,604, Cl. 364-900.000.
Gill, Lloyd T., to General Motors Corporation. Compact odd cylinder V-type engine. 4,480,600, Cl. 123-52.0MV.
Gillam, David R.; and Rolfe, John A., to Electrak International, Inc. Electrical plug with automatic shut-off feature. 4,481,388, Cl. 200-51.00R.
Giller, Solomon A., deceased: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.
Gilman, Norman W.: *See*—
Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, 4,481,142, Cl. 260-243.300.
Gilmore, William J., to Acco Babcock Inc. Device to translate oscillatory motion into reciprocating motion. 4,480,494, Cl. 74-473.0SW.
Gils, Reiner, to Behringwerke Aktiengesellschaft. Process for determining streptococcal desoxyribonuclease B according to the toluidine blue O method. 4,481,291, Cl. 435-6.000.
Ginatta, Marco, to Snamprogetti S.p.A. Frame for supporting and treating spent electrical accumulators in processes for the electrochemical extraction of the metals contained therein. 4,481,098, Cl. 204-297.00W.
Ginter, Sally P.; and Hamlin, Percy J., to Dow Chemical Company, The. Sanitizing complexes of polyoxazolines or polyoxazines and polyhalide anions. 4,481,167, Cl. 422-29.000.
Giral, Louis: *See*—
Dubois, Jean C.; Gazard, Maryse; Schue, Francois; Giral, Louis; Rolland, Michel; and Aldissi, Mahmoud, 4,481,132, Cl. 252-519.000.
Girard, Theodore A.; and Foelsch, Donald H., to Glyco Inc. Water dispersible fatty acid bis-amides. 4,481,038, Cl. 106-271.000.
Giroflex Entwicklungs AG: *See*—
Locher, Hermann, 4,480,497, Cl. 74-531.000.
Giron, Daniel G., to Michelin Recherche et Technique S.A. Tread and heavy duty tire. 4,480,671, Cl. 152-209.00R.
Gist-Brocades N.V.: *See*—
Apontoweil, Peter; and Krasselt, Manfred M., 4,481,188, Cl. 424-89.000.
Givaudan Corporation: *See*—
Gonzenbach, Hans U.; and Ochsner, Paul A., 4,481,133, Cl. 252-522.00R.
Gladfelter, Elizabeth J.; and Rogier, Edgar R., to Henkel Corporation. Glycidyl ether of gem-bis(hydroxymethyl) hydrocarbons. 4,481,348, Cl. 528-103.000.
Glaser, Roger M.: *See*—
Petrofsky, Jerrold S.; Glaser, Roger M.; Petrofsky, Steven H.; and Heaton, Harry H., III, 4,480,830, Cl. 272-117.000.
Glavan, Kenneth A.: *See*—
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Glaxo Group Limited: *See*—
Carey, Linda; Price, Barry J.; Clitherow, John W.; Bradshaw, John; Martin-Smith, Michael; Bays, David E.; and Blatcher, Philip, 4,481,199, Cl. 424-246.000.
Glennon, Timothy F.: *See*—
Mehl, Byron R.; Olson, Raymond N.; and Glennon, Timothy F., 4,481,459, Cl. 322-10.000.
Glock, Alfred; Seebo, Kurt; Schoenung, Bernhard; and Tkotz, Dieter, to SKF Kugellagerfabriken GmbH. Roving holding mechanism for draw frames. 4,480,354, Cl. 19-0.250.
Glory Kogyo Kabushiki Kaisha: *See*—
Nakai, Shiro; and Baba, Takao, 4,480,651, Cl. 133-3.00A.
Glotin, Bernard J. P.: *See*—
Goldaniga Rene F.; Walter, Geard; Walter G. W.; Glotin, Bernard J. P.; and Gallois, Daniel, 4,480,697, Cl. 166-372.000.
Glyco Inc.: *See*—
Girard, Theodore A.; and Foelsch, Donald H., 4,481,038, Cl. 106-271.000.
Hall, Larry K.; and Rosen, Marvin, 4,481,324, Cl. 524-312.000.
Godard, Dominique, to International Business Machines Corp. Method and apparatus for receiving a data signal modulated by means of a double sideband-quadrature carrier modulation technique. 4,481,646, Cl. 375-77.000.
Godfrey, A. Dale: *See*—
Peterson, Edward D.; Godfrey, A. Dale; Douglas, Claire R.; and Pennington, Carl R., 4,480,639, Cl. 128-207.180.
Godlewski, Robert E.; and Osterholtz, Frederick D., to Union Carbide Corporation. Novel reinforcing additive and method of reinforcing thermoplastic polymer therewith. 4,481,322, Cl. 524-265.000.
Goetz, Carl A.: *See*—
Darnell, Robert D.; Goetz, Carl A.; and Ingle, William M., 4,480,989, Cl. 432-1.000.
Goitein, Michael: *See*—
Boyer, Arthur L.; and Goitein, Michael, 4,480,920, Cl. 356-376.000.
Gokcen, Mehmet R. Device for converting energy. 4,480,592, Cl. 122-26.000.
Gold, Kenneth S. Electronic audio blending system. 4,480,520, Cl. 84-1.160.
Goldaniga Rene F.; Walter, Geard; Walter G. W.; Glotin, Bernard J. P.; and Gallois, Daniel, to Compagnie Francaise Des Petroles; and Slumberger Technology Corporation. Method and apparatus for converting an oil well to a well with effluent raising by gas-lift. 4,480,697, Cl. 166-372.000.
Goldberg, Paul R., to Advanced Imaging Devices, Inc. Color video hardcopy recorder, method and media therefor. 4,481,542, Cl. 358-331.000.
Goldstein, Vladimir. Thermal storage heat exchanger systems of heat pumps. 4,480,445, Cl. 62-434.000.
Gombert, Glenn J.; and Palmquist, Steven R., to Tektronix, Inc. Method and apparatus of compensating for variations in signal propagation time existing within the channels of a multi-channel device. 4,481,647, Cl. 375-107.000.
Gomez, Daniel: *See*—
Dailly, Christian; and Gomez, Daniel, 4,481,075, Cl. 162-145.000.

Gonzenbach, Hans U.; and Ochsner, Paul A., to Givaudan Corporation. Odorant and/or flavorant substances. 4,481,133, Cl. 252-522.00R.

Gooch, Charles W. Spring covering device. 4,480,652, Cl. 135-88.000.

GoodMark Foods, Inc.: *See—*
Loge, David B.; Cole, William A.; and Migdal, Kevin J., 4,480,745, Cl. 206-44.00R.

Goodyear Tire & Rubber Company, The: *See—*
Ambler, Michael R.; and Burroway, Gary L., 4,481,329, Cl. 524-501.000.
Burlett, Donald J.; and Parker, Dane K., 4,481,337, Cl. 525-340.000.
Payne, Roger E., 4,480,670, Cl. 152-169.000.

Gorski, Richard M., to Zenith Electronics Corporation. Electron gun for projection television cathode ray tubes. 4,481,445, Cl. 315-14.000.

Gortan, Guido, to Secalt, S.A. Apparatus for clamping and/or longitudinally moving an elongate traction means. 4,480,816, Cl. 254-264.000.

Gorton, William S., Jr.: *See—*
Sattler, Frank A.; and Gorton, William S., Jr., 4,481,258, Cl. 428-371.000.

Gotoh, Yoshihisa: *See—*
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yokote, Sachio; Sekiguchi, Katsumi; Sasagawa, Katsuyoshi; and Imai, Masao, 4,481,131, Cl. 252-511.000.

Gottwalt, Karl: *See—*
Koller, Manfred; Itzinger, Hermann; Handke, Gunther; Gottwalt, Karl; and Eusemann, Robert, 4,480,730, Cl. 188-315.000.

Gouda, Tadahiro: *See—*
Hatata, Minoru; and Gouda, Tadahiro, 4,481,629, Cl. 371-57.000.

Gough, Martin J.; and Rogers, John V., to Cal Gavin Limited. Insert for placement in a vessel and method of forming the insert. 4,481,154, Cl. 261-94.000.

Goursat, Albert-Gilbert; Hersant, Thierry; and Nicolas, Jacques, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method and apparatus for the protection of molten metal flows in furnaces. 4,480,770, Cl. 222-590.000.

Gowda, Srinivasa R.: *See—*
Annis, Jeffrey R.; and Gowda, Srinivasa R., 4,481,655, Cl. 378-125.000.

Grabmaier, Josef: *See—*
Foell, Helmut; Freienstein, Bernhard; Geim, Karl; Grabmaier, Josef; and Hintringer, Otmar, 4,481,235, Cl. 427-74.000.

Graf, Donald V.: *See—*
Schukei, Glen E.; Formanek, Frank J.; and Graf, Donald V., 4,480,841, Cl. 277-1.000.

Graham, Ron: *See—*
Aparicio, Thomas, Jr.; Nagel, Dave D.; and Graham, Ron, 4,480,510, Cl. 81-57.390.

Graham, Thomas E.; and Sabelman, Eric E., to Collagen Corporation. Human skin model for intradermal injection demonstration or training. 4,481,001, Cl. 434-267.000.

Grain Systems, Inc.: *See—*
Sloan, Craig, 4,480,534, Cl. 98-55.000.

Grande, Gary R. Liquid distribution device. 4,480,793, Cl. 239-567.000.

Grannen, Walter A., III, to E-W Mold & Tool Company, Inc. Pressure stabilized injection mold. 4,481,161, Cl. 264-328.800.

Grant, Nicholas J.; and Robinson, Ramon K., to Massachusetts Institute of Technology. Process for producing high hafnium carbide containing alloys. 4,481,034, Cl. 75-236.000.

Grapha-Holding AG: *See—*
Futterer, Klaus-Jurgen, 4,480,518, Cl. 83-508.000.

Gras, Gilbert: *See—*
Leveque, Jean-Luc; and Gras, Gilbert, 4,480,921, Cl. 356-434.000.

Gratec, Inc.: *See—*
Aparicio, Thomas, Jr.; Nagel, Dave D.; and Graham, Ron, 4,480,510, Cl. 81-57.390.

Graves, Robert W., to Aeroquip Corporation. Gimbal conduit joint. 4,480,857, Cl. 285-45.000.

Gray, Stanley D., to Anti-Fire Foam, Inc. Pretreatment method of producing fire retardant foam. 4,481,308, Cl. 521-120.000.

Grayson, James I.: *See—*
Dinkel, Rolf; Roedel, Hilmar; and Grayson, James I., 4,481,361, Cl. 546-251.000.

Great Lakes Chemical Corporation: *See—*
Halley, James L., 4,481,296, Cl. 436-163.000.

Greenfield, Alan, to Robert Jenkins & Co. Welding of tubes to tube plates. 4,481,399, Cl. 219-60.200.

Greenwood, William S., to Thomas & Betts Corporation. Adapter and method for tapping or splicing flat multiconductor cable. 4,480,889, Cl. 339-99.00R.

Grimm, Duane H.; and Michaels, William J., to Sundstrand Corporation. Energy absorbing bidirectional ratchet no-back apparatus. 4,480,733, Cl. 192-8.00R.

Grincourt, Bernard: *See—*
Bayart, Martin; Grincourt, Bernard; and Chabierski, Rene , 4,480,660, Cl. 137-478.000.

Grollier, Jean-Francois; and Boudy, Francoise, to Societe Anonyme dite: L'Oreal. Stable emulsions obtained from a natural emulsifier stabilized with aloes juice. 4,481,185, Cl. 424-59.000.

Grossman, Jonathan G.; Casperson, Lee W.; and Stafsudd, Oscar M., Jr., to University of California, The Regents of the. RF Excited metal waveguide laser. 4,481,634, Cl. 372-87.000.

Grudinin, Vladimir P.; Bukhteev, Boris M.; and Dergunova, Tatyana V., to Vsesojuznoe Nauchno-Proizvodstven Noe Obiedinenie Tsellulozno-Bumazhnoi Promyshlennosti. Method for recovery of wastewater residues. 4,481,072, Cl. 162-16.000.

Grummett, Lorne H., to Trilog, Inc. Control system for dot matrix line printer. 4,480,541, Cl. 101-93.040.

GTE Automatic Electric Inc.: *See—*
Reimer, William A., 4,480,808, Cl. 248-73.000.

Guazzo, Lucien; and Vives, Jean-Patrick, to Les Cables de Lyon. Device for preventing damage to a submarine cable at the point where it leaves an equipment casing during passage round the cable drum and over the davit. 4,481,381, Cl. 174-135.000.

Guegan, Remy: *See—*
Cazaubon, Catherine; Diaz, Joseph; Guegan, Remy; Castro, Bernard; Evin, Genevieve; Corvol, Pierre; and Gagnol, Jean-Pierre, 4,481,192, Cl. 424-177.000.

Guillaume, Bernard: *See—*
Aspart, Alain; Guillaume, Bernard; and Moulin, Jean-Paul, 4,481,135, Cl. 252-632.000.

Guiriec, Gerard, to Semada, Alsthom-Atlantique; and Societe Industrielle Lorientaise (S.I.L.). Installation for processing chunks of animal matter. 4,480,993, Cl. 432-266.000.

Gundlach, Gregory E.; and Marshall, Grayson. Method of making a three-dimensional photograph. 4,481,050, Cl. 156-58.000.

Gurcew, Ronald J.: *See—*
Marciniczyk, Henry J.; and Gurcew, Ronald J., 4,480,823, Cl. 267-91.000.

Guttinger, Heinz: *See—*
Feldman, Hugo; and Guttinger, Heinz, 4,480,459, Cl. 72-243.000.

H. B. Fuller Company: *See—*
Clausen, Victor H.; and Asbury, Charles E., 4,481,054, Cl. 156-177.000.
Clausen, Victor H.; and Asbury, Charles E., 4,481,055, Cl. 156-177.000.
Clausen, Victor H.; and Asbury, Charles E., 4,481,065, Cl. 156-440.000.

Haas, Gerhard J.: *See—*
Crosby, Wayne H.; Fulger, Charles V.; Haas, Gerhard J.; and Nesheiwat, Donna M., 4,481,226, Cl. 426-540.000.

Habenstein, Klaus, to Behringwerke Aktiengesellschaft. Substituted or condensed pyridines in a process for the detection of substances having a peroxidatic effect and a diagnostic agent containing such pyridines. 4,481,295, Cl. 436-66.000.

Hacobs, Hans: *See—*
Noll, Hans; Bangert, Wilfried; and Hacobs, Hans, 4,480,821, Cl. 266-54.000.

Hadersbeck, Hans: *See—*
Andrascek, Ernst; Hadersbeck, Hans; and Wallenhorst, Friedhelm, 4,481,035, Cl. 106-1.230.

Haemonetics Corporation: *See—*
Lueptow, Richard M., 4,480,751, Cl. 206-628.000.

Haendle, Joerg, to Siemens Aktiengesellschaft. X-Ray diagnostic installation for X-ray tomographic images. 4,481,651, Cl. 378-22.000.

Haeusler, Jochen, to Siemens Aktiengesellschaft. Method and apparatus for separating, ordering and feeding metallic workpieces. 4,480,739, Cl. 198-381.000.

Hafner, Hans W., to Pfister GmbH. Weighing appliance, particularly for measuring a great weight with high precision. 4,480,707, Cl. 177-208.000.

Haga, Yoshihiro: *See—*
Yamada, Yoshitaka; Iijima, Toshifumi; Yagi, Toshihiko; Haga, Yoshihiro; Kumashiro, Kenji; and Menjo, Hiroshi, 4,481,288, Cl. 430-506.000.

Haggar Company: *See—*
Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., 4,481,067, Cl. 156-541.000.

Hagiwara, Sekine: *See—*
Hughes, Jodie K.; and Hagiwara, Sekine, 4,481,578, Cl. 364-200.000.

Haiges, Paul E., Jr.: *See—*
Babuka, Robert; Burke, Andrea; and Haiges, Paul E., Jr., 4,480,884, Cl. 339-17.00L.

Haigh, Leonard; and Morrison, Robert H., to Needle Industries Limited. Feed means for elongate articles. 4,480,382, Cl. 29-786.000.

Hajdu, Johann: *See—*
Bazlen, Dieter; Hajdu, Johann; and Knauft, Gunter, 4,481,575, Cl. 364-200.000.

Hakamada, Kouhei: *See—*
Iwase, Takatoshi; Fuma, Kazunari; Nakagawa, Akira; and Hakamada, Kouhei, 4,480,456, Cl. 72-185.000.

Hakanson, Bo H., to Crafon Medical AB. Thermistors, their method of production. 4,480,376, Cl. 29-593.000.

Haldor Topsoe A/S: *See—*
Jorn, Ernest; and Rostrup-Nielsen, Jens R., 4,481,305, Cl. 518-705.000.

Hall, Jeffrey J. Ladder caddy. 4,480,810, Cl. 248-238.000.

Hall, Larry K.; and Rosen, Marvin, to Glyco Inc. Polyglycerol plastic lubricants. 4,481,324, Cl. 524-312.000.

Halley, James L., to Great Lakes Chemical Corporation. Color indicator system for pH measurement. 4,481,296, Cl. 436-163.000.

Halliar, William R.: *See—*
Brodeur, Rene H.; Terlecky, Boris S.; Sellberg, Ronald P.; and Halliar, William R., 4,480,554, Cl. 105-171.000.

Halliburton Company: *See—*
Almond, Stephen W.; and Harris, Phillip C., 4,480,696, Cl. 166-308.000.
Robbins, Carl A., 4,481,597, Cl. 364-604.000.

Hallock, Dale P.: *See—*
Bouldin, Dennis P.; Hallock, Dale P.; Roberts, Stanley; and Ryan, James G., 4,481,046, Cl. 148-188.000.

Halpaap, Reinhard: *See*—
Nachtkamp, Klaus; Bock, Manfred; Halpaap, Reinhard; and Pedain, Josef, 4,481,345, Cl. 528-59.000.
Halsor, Svein R.; and Storset, Magnar K., to Elkem a/s. Methods of flaw detection in billets. 4,480,928, Cl. 374-5.000.
Hamada Printing Press Mfg. Co., Ltd.: *See*—
Kaneko, Midori, 4,480,826, Cl. 271-103.000.
Hamamoto, Takashi: *See*—
Haruta, Masahiro; Hamamoto, Takashi; and Toganoh, Shigeo, 4,481,244, Cl. 428-155.000.
Hamlin, Percy J.: *See*—
Ginter, Sally P.; and Hamlin, Percy J., 4,481,167, Cl. 422-29.000.
Hammacher, Paul D., to Champion International Corporation. Shopping bag handle and method of manufacture thereof. 4,481,668, Cl. 383-7.000.
Hamon-Sobelco, S.A.: *See*—
Le Covec, Jean, 4,481,156, Cl. 261-111.000.
Hanak, Joseph J., to RCA Corporation. Method of depositing a semiconductor layer from a glow discharge. 4,481,230, Cl. 427-39.000.
Hancor, Inc.: *See*—
Rosenbaum, Larry A., 4,480,855, Cl. 285-3.000.
Handke, Gunther: *See*—
Koller, Manfred; Itzinger, Hermann; Handke, Gunther; Gottwalt, Karl; and Eusemann, Robert, 4,480,730, Cl. 188-315.000.
Haneda, Satoshi: *See*—
Itaya, Masahiko; Haneda, Satoshi; and Tomono, Makoto, 4,480,911, Cl. 355-3.0DD.
Hankins, Charles R.: *See*—
Beam, William D.; Chrisman, David C.; Cox, Lloyd R.; and Hankins, Charles R., 4,480,990, Cl. 432-9.000.
Hanmura, Hisao; and Takasaka, Masahiro, to Hitachi, Ltd. Matrix display device. 4,481,511, Cl. 340-752.000.
Hanna, Marie R.: *See*—
Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,481,225, Cl. 426-538.000.
Hans Hitzel, Inc.: *See*—
Hitzel, Hans, 4,481,112, Cl. 210-620.000.
Hansen, Anker J. Method and a device for measuring concrete maturity. 4,480,929, Cl. 374-53.000.
Hansen, Kenneth N., to Allis-Chalmers Corp. Combination swingout battery tray and step. 4,480,710, Cl. 180-68.500.
Hansen, Kenneth N., to Allis-Chalmers Corp. Side mounted fuel tank on a tractor. 4,480,845, Cl. 280-5.00A.
Hanson, Kerry A., to Texas Instruments Incorporated. Integrated circuit FSK modem. 4,481,642, Cl. 375-9.000.
Hara, Kuniko: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,481,217, Cl. 424-311.000.
Hara, Yoshiji, to Kabushiki Kaisha Johnan Seisakusho. Wire-type door or other window regulator for an automotive vehicle. 4,480,409, Cl. 49-352.000.
Harada, Tatsuo: *See*—
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, 4,480,910, Cl. 355-30.000.
Harbst, John W.; and Frendreis, James A., to Union Special Corporation. Sewing machine needle cooler. 4,480,565, Cl. 112-281.000.
Hardware Designers, Inc.: *See*—
Leiper, Fred B., 4,480,878, Cl. 308-3.800.
Hareng, Michel; Hehlen, Robert; LeBerre, Serge; and Leclerc, Pierre, to Thomson-CSF. Electrooptical switching device. 4,481,510, Cl. 340-784.000.
Harper, Allan C.; Jones, Edwin L.; and Beaver, Ivan D., to Wallace Murray Corporation. Turbocharger compressor end ventilation system. 4,480,440, Cl. 60-605.000.
Harreus, Albrecht; Kaiser, Eduard; Seip, Detlev; and Zimmermann, Wolfgang, to Hoechst Aktiengesellschaft. Pulverulent polymer composition, a process for its preparation and adhesive based thereon. 4,481,328, Cl. 524-493.000.
Harris Graphics Corporation: *See*—
Richey, Jarold L., 4,481,068, Cl. 156-548.000.
Harris, Phillip C.: *See*—
Almond, Stephen W.; and Harris, Phillip C., 4,480,696, Cl. 166-308.000.
Harter, James R.; and Freeman, Gary M., to Hyperion, Inc. Flow monitoring device. 4,480,467, Cl. 73-204.000.
Hartnett, Thomas M.; Gentilman, Richard L.; and Maguire, Edward A., to Raytheon Company. Aluminum oxynitride having improved optical characteristics and method of manufacture. 4,481,300, Cl. 501-98.000.
Haruna, Tohru: *See*—
Nakahara, Yutaka; Haruna, Tohru; and Tobita, Etsuo, 4,481,317, Cl. 524-119.000.
Haruta, Masahiro; Hamamoto, Takashi; and Toganoh, Shigeo, to Canon Kabushiki Kaisha. Material used to bear writing or printing. 4,481,244, Cl. 428-155.000.
Hasegawa, Jun: *See*—
Kono, Hiroya; Hasegawa, Jun; Deguchi, Hiroyuki; and Kobayashi, Hisao, 4,480,961, Cl. 417-15.000.
Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, to Fuji Photo Film Co., Ltd. Method for production of magnetic recording media. 4,481,231, Cl. 427-44.000.
Hashimoto, Mitsuru; Sakai, Kiyoshi; Fukagai, Toshio; Katoh, Tatsuya, deceased (by Katoh, Tazuko, heir); and by Katoh, Mankichi, legal representative, to Ricoh Company, Ltd. Layered electrophotographic photoconductor containing a hydrazone. 4,481,271, Cl. 430-57.000.
Hata, Hideo: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,481,334, Cl. 525-211.000.
Hatata, Minoru; and Gouda, Tadahiro, to Mitsubishi Denki Kabushiki Kaisha. Abnormal signal detecting device. 4,481,629, Cl. 371-57.000.
Hattori, Yoshiyuki; and Matsui, Kazuma, to Nippondenso Co., Ltd. Driving mechanism for vehicle engine and accessory. 4,481,424, Cl. 290-38.00R.
Hauler, Peter; Rothley, Manfred; and Zabler, Erich, to Robert Bosch GmbH. Rotary speed sensor with Hall generator responding to tangential component of magnetic field. 4,481,469, Cl. 324-174.000.
Hauze, Albert W.: *See*—
Suplinskas, Raymond J.; and Hauze, Albert W., 4,481,257, Cl. 428-366.000.
Hawkins, Jeanette C.; Sella, Nancy W.; and Bradford, Carl D., to Fieldcrest Mills, Inc. Pillow sham. 4,480,346, Cl. 5-490.000.
Hawkins, Jeanette C.; Sella, Nancy W.; and Bradford, Carl D., to Fieldcrest Mills, Inc. Pillow sham. 4,480,347, Cl. 5-490.000.
Hawkins, Walter H. Modified strip mining apparatus. 4,480,872, Cl. 299-56.000.
Hayami, Tadao, to Copal Company Limited. Camera shutter with a pair of sector drive rings. 4,480,900, Cl. 354-234.100.
Hayashi, Yoshiaki: *See*—
Sakaguchi, Iwao; and Hayashi, Yoshiaki, 4,481,358, Cl. 544-99.000.
Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Front cover of automotive engine. 4,480,609, Cl. 123-195.00C.
Hayes, Edwin H., to Du Pont de Nemours, E. I., and Company. Process for laminating aramid waterleaves. 4,481,060, Cl. 156-309.900.
Hayes, Ernest B. Filter device. 4,480,649, Cl. 131-336.000.
Haywood, Ronald S.; and Landini, Melvin L. Humidifier, vaporizer and room freshener. 4,480,786, Cl. 237-78.00R.
Healey, Robert W., to Lowrance Electronics, Inc. Gimbal bracket mounting for instrument. 4,480,809, Cl. 248-185.000.
Health Products Research, Inc.: *See*—
Stoy, Vladimir A.; and Stoy, George P., 4,480,642, Cl. 128-341.000.
Heaton, Harry H., III: *See*—
Petrofsky, Jerrold S.; Glaser, Roger M.; Petrofsky, Steven H.; and Heaton, Harry H., III, 4,480,830, Cl. 272-117.000.
Heberlein Hispano SA: *See*—
Vignon, Louis; and Schopper, Alf, 4,480,355, Cl. 19-236.000.
Hechler, Hatto, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Enclosed gravure printing machine. 4,480,543, Cl. 101-152.000.
Heft, Eldon B.; and Klein, Keith W., to General Electric Company. Insulated latch-cradle mechanism. 4,481,491, Cl. 335-21.000.
Hehlen, Robert: *See*—
Hareng, Michel; Hehlen, Robert; LeBerre, Serge; and Leclerc, Pierre, 4,481,510, Cl. 340-784.000.
Heidelberger Druckmaschinen: *See*—
Jeschke, Willi, 4,480,542, Cl. 101-148.000.
Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Jeschke, Willi; and Junghans, Rudi, 4,480,547, Cl. 101-363.000.
Heilweil, Israel, to Mobil Oil Corporation. High temperature stable aqueous brine fluids viscosified by N-heterocyclic organophosphorus compounds. 4,481,120, Cl. 252-8.50A.
Heimer, Robbin; Shepard, Thomas C.; and Lucier, Peter F., to Cen-T-Lap Corp. Precision center lapping apparatus and method. 4,480,410, Cl. 51-5.00D.
Hein, Paul R.: *See*—
Tsao, Jung-Hsien; and Hein, Paul R., 4,481,281, Cl. 430-284.000.
Heinen, Heinrich: *See*—
Lusch, Jurgen; Lieder, Bernhard; Heinen, Heinrich; and Kolodzey, Wolfgang, 4,481,015, Cl. 48-202.000.
Heinle, Georg, to Siemens Aktiengesellschaft. Method and circuitry for approximating the magnitude of a vector. 4,481,601, Cl. 364-815.000.
Heiss, Dieter: *See*—
Matzold, Uwe; and Heiss, Dieter, 4,481,671, Cl. 455-92.000.
Heissenberger, Otto; Petschauer, Franz; and Sbaschnigg, Johann, to Maschinenfabrik Andritz Actiengesellschaft. Method and apparatus for rinsing filter cake. 4,481,118, Cl. 210-783.000.
Heldenbrand, William C.: *See*—
Henry, Robert R.; and Heldenbrand, William C., 4,480,482, Cl. 73-805.000.
Helfman, Robert: *See*—
Shacket, Sheldon; and Helfman, Robert, 4,480,420, Cl. 52-745.000.
Helmic, Inc.: *See*—
Jaskowski, Michael C., 4,481,355, Cl. 536-2.000.
Hendrickson, William A.: *See*—
Kolpe, Vasant V.; Sherman, Dudley M.; Hendrickson, William A.; and Chou, Hsin-hsin, 4,481,234, Cl. 427-71.000.
Henkel Corporation: *See*—
Gladfelter, Elizabeth J.; and Rogier, Edgar R., 4,481,348, Cl. 528-103.000.
Hennequin, Petrus J.: *See*—
Brugman, Johannes A.; and Hennequin, Petrus J., 4,480,360, Cl. 24-295.000.
Henricks, Gwenne A. E.; Pickering, William; and Wiblin, Wayne T., to Towmotor Corporation. Voltage adaptive solenoid control apparatus. 4,481,554, Cl. 361-152.000.
Henry, Charles H.; and Logan, Ralph A., to AT&T Bell Laboratories. Loss stabilized buried heterostructure laser. 4,481,631, Cl. 372-45.000.
Henry, Robert R.; and Heldenbrand, William C. Elastic limit detection and reset testing system. 4,480,482, Cl. 73-805.000.

Henson, H. Keith; and Drexler, K. Eric. Method for processing and fabricating metals in space. 4,480,677, Cl. 164-46.000.

Hentschel, Karl-Heinz; Dhein, Rolf; Kussi, Siegfried; Winter, Hans; and Vojacek, Herbert, to Bayer Aktiengesellschaft. Polyethers, their preparation and their use as lubricants. 4,481,123, Cl. 252-52.00R.

Herbrich, Horst; Kuchler, Rainer; and Streng, Erich, to Messer Griesheim GmbH. Laser, particularly CO_2 gas transport laser. 4,481,632, Cl. 372-58.000.

Hercules Chemical Company, Inc.: *See*—
Mackowiak, Leonard S.; Ellison, Frank E.; Fidler, Jay W.; Tucker, N. George; and Varma, Gangdhar M. N., 4,481,010, Cl. 44-5.000.

Hercules Incorporated: *See*—
Newburg, Norman R., deceased, 4,481,344, Cl. 526-283.000.

Herisson, Jean-Louis, to Produits Chimiques Ugine Kuhlmann. Process for the polymerization of tetrafluoroethylene in aqueous dispersion. 4,481,343, Cl. 526-255.000.

Herman, Richard L., to International Business Machines Corporation. Ballistic print wire actuator using a telescopic armature. 4,480,934, Cl. 400-124.000.

Hernandez, Charles, to Compagnie Continentale de Signalisation. Teletext system for displaying data on the screen of a television receiver. 4,481,536, Cl. 358-147.000.

Heroid, Manfred: *See*—
Rebel, Herbert; and Herold, Manfred, 4,480,548, Cl. 101-426.000.

Herrick, Franklin W., to International Telephone and Telegraph Corporation. Redispersible microfibrillated cellulose. 4,481,076, Cl. 162-158.000.

Herrick, Franklin W., to International Telephone and Telegraph Corporation. Process for preparing microfibrillated cellulose. 4,481,077, Cl. 162-158.000.

Herring, William J.: *See*—
Gilham, Dennis T.; Williams, Thomas D.; Ananthan, Manickam; and Herring, William J., 4,481,604, Cl. 364-900.000.

Hersant, Thierry: *See*—
Goursat, Albert-Gilbert; Hersant, Thierry; and Nicolas, Jacques, 4,480,770, Cl. 222-590.000.

Herter, Christian: *See*—
Herter, George L.; and Herter, Christian, 4,480,691, Cl. 166-267.000.

Herter, George L.; and Herter, Christian. Recycled fatty acid crude petroleum recovery process. 4,480,691, Cl. 166-267.000.

Hesse, Wolfgang; Ritz, Jurgen; and Zimmermann, Rolf, to Hoechst Aktiengesellschaft. Binders based on co-condensates of epoxy resins and resols with amines a process for their preparation and for electrophoretic deposition, and an electrophoresis bath. 4,481,311, Cl. 523-424.000.

Hetzler, Lewis R.: *See*—
Huntzinger, Gerald O.; Butler, Raymond O., Jr.; Hetzler, Lewis R.; Delaplane, John; and Marks, Anthony L., 4,481,585, Cl. 364-424.000.

Hewlett-Packard Company: *See*—
Dukes, John N.; Bryson, Charles E., III; Weber, Lynn; and Morganthaler, Mark, 4,480,913, Cl. 356-319.000.
Noguchi, Hitoshi; Akiyama, Tomoyuki; Akama, Hideo; Okara, Hideo; and Yoshino, Hisao, 4,481,464, Cl. 324-57.0PS.

Hibino, Noburo: *See*—
Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, 4,481,231, Cl. 427-44.000.

Hickmann, Jerome L.: *See*—
Meives, Otis E.; Verhyen, Larry L., deceased; and Hickmann, Jerome L., 4,480,422, Cl. 53-207.000.

Hickson, Alan D., to T & L Electronics, Inc. Solar power station. 4,481,562, Cl. 362-183.000.

Higuchi, Mitsuo; and Takeuchi, Atsushi, to Fujitsu Limited. Semiconductor memory miniaturized by line groups and staggered cells. 4,481,609, Cl. 365-72.000.

Higuchi, Yoichi: *See*—
Okabayashi, Makoto; Takeishi, Yasuo; Higuchi, Yoichi; and Taguchi, Kazuto, 4,480,988, Cl. 431-329.000.

Hilson, David G., II: *See*—
Johnson, Gary W.; Schoonejongen, Ronald J.; and Hilson, David G., II, 4,481,261, Cl. 428-434.000.

Hinman, David C.; and Saleeb, Fouad Z., to General Foods Corporation. Decaffeination with treated activated carbon. 4,481,223, Cl. 426-422.000.

Hintringer, Otmar: *See*—
Foell, Helmut; Freienstein, Bernhard; Geim, Karl; Grabmaier, Josef; and Hintringer, Otmar, 4,481,235, Cl. 427-74.000.

Hioki, Toshiaki, to Sanyo Electric Co., Ltd. Motor controlling circuit of reproducing apparatus and method of controlling. 4,481,615, Cl. 369-50.000.

Hirahashi, Akira: *See*—
Asano, Yuichiro; Suzuki, Taira; Yabe, Tadashi; Kurita, Kunio; Ohga, Suehisa; Hirahashi, Akira; and Momose, Atsushi, 4,480,919, Cl. 356-376.000.

Hiraiwa, Atsushi: *See*—
Suzuki, Keizo; Hiraiwa, Atsushi; Takahashi, Shigeru; Nishimatsu, Shigeru; Ninomiya, Ken; and Okudaira, Sadayuki, 4,481,229, Cl. 427-38.000.

Hiraizumi, Mitsuo: *See*—
Inaba, Hajimu; Ono, Yukio; and Hiraizumi, Mitsuo, 4,481,568, Cl. 364-167.000.

Hirakawa, Tadashi; and Sasashige, Hiroaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Single facer. 4,481,066, Cl. 156-472.000.

Hiramatsu, Akira, to Canon Kabushiki Kaisha. Anti-mirror-bounce device for single-lens reflex camera. 4,480,904, Cl. 354-479.000.

Hiramatsu, Rihei; Takeshita, Ko; and Inoue, Tokunari, to Densetsukiki Industry Co., Ltd. Switching regulator. 4,481,461, Cl. 323-272.000.

Hirano, Shigeo: *See*—
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, 4,481,285, Cl. 430-410.000.

Hirao, Kazuhiro: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Hirao, Kazuhiro; and Hirayama, Ryuta, 4,481,097, Cl. 204-290.00F.

Hiraoka, Ryosei: *See*—
Fukunaga, Yasushi; Bandoh, Tadaaki; Matsumoto, Hidekazu; Hiraoka, Ryosei; Ide, Jushi; Kato, Takeshi; and Kawakami, Tetsuya, 4,481,573, Cl. 364-200.000.

Hirata, Yasushi: *See*—
Ogawa, Masaki; Hirata, Yasushi; and Tsuchikura, Akira, 4,481,327, Cl. 524-432.000.

Hirayama, Ryuta: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Hirao, Kazuhiro; and Hirayama, Ryuta, 4,481,097, Cl. 204-290.00F.

Hiroshi, Niimi; Meiji, Anahara; and Shigeru, Muramatsu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Kabushiki Kaisha Toyota ChuoKenkyuscho. Air nozzle for processing a fiber bundle. 4,480,434, Cl. 57-333.000.

Hirsch, Paul: *See*—
Nibbe, Bodo B.; and Hirsch, Paul, 4,481,392, Cl. 219-10.55E.

Hitachi Automotive Engineering Co., Ltd.: *See*—
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, 4,480,618, Cl. 123-438.000.

Hitachi Engineering Co., Ltd.: *See*—
Fukunaga, Yasushi; Bandoh, Tadaaki; Matsumoto, Hidekazu; Hiraoka, Ryosei; Ide, Jushi; Kato, Takeshi; and Kawakami, Tetsuya, 4,481,573, Cl. 364-200.000.

Hitachi, Ltd.: *See*—
Arima, Hideo; Kaneyasu, Masayoshi; and Ito, Mitsuko, 4,481,499, Cl. 338-34.000.
Ezawa, Masayoshi; Misumi, Akira; Suzuki, Kenkichi; and Kumada, Masaharu, 4,481,265, Cl. 429-9.000.
Fukunaga, Yasushi; Bandoh, Tadaaki; Matsumoto, Hidekazu; Hiraoka, Ryosei; Ide, Jushi; Kato, Takeshi; and Kawakami, Tetsuya, 4,481,573, Cl. 364-200.000.
Hanmura, Hisao; and Takasaka, Masahiro, 4,481,511, Cl. 340-752.000.
Ito, Shigeyuki; Watatani, Yoshizumi; and Owashi, Hitoaki, 4,481,546, Cl. 360-30.000.
Izumida, Tatsuo; Kato, Koji; and Kawamura, Fumio, 4,481,089, Cl. 204-129.430.
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, 4,480,618, Cl. 123-438.000.
Sato, Hideo; Nishihara, Motohisa; Yamada, Kazuji; and Suzuki, Seikou, 4,480,478, Cl. 73-708.000.
Suzuki, Keizo; Hiraiwa, Atsushi; Takahashi, Shigeru; Nishimatsu, Shigeru; Ninomiya, Ken; and Okudaira, Sadayuki, 4,481,229, Cl. 427-38.000.
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, 4,480,910, Cl. 355-30.000.
Yabe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, 4,481,003, Cl. 445-49.000.
Yano, Kiyoshi; Taneda, Yukinori; and Kobayashi, Takashi, 4,480,799, Cl. 242-25.00R.

Hitachi Metals International Ltd.: *See*—
Parker, Rollin J., 4,481,437, Cl. 310-191.000.

Hitachi Metals, Ltd.: *See*—
Yano, Mitsuru; and Inoue, Akira, 4,480,849, Cl. 280-433.000.

Hitachi Plant Engineering and Construction Co., Ltd.: *See*—
Izumida, Tatsuo; Kato, Koji; and Kawamura, Fumio, 4,481,089, Cl. 204-129.430.

Hitachi Zosen Corporation: *See*—
Koshoji, Yoshihiro; and Sato, Kenji, 4,480,817, Cl. 254-332.000.

Hitzel, Hans, to Hans Hitzel, Inc. Process of treating gas condensate. 4,481,112, Cl. 210-620.000.

Hiyama, Dean H.: *See*—
Hiyama, Kazuo; Hiyama, Howard K.; and Hiyama, Dean H., 4,480,402, Cl. 47-1.00R.

Hiyama Farms, Inc.: *See*—
Hiyama, Kazuo; Hiyama, Howard K.; and Hiyama, Dean H., 4,480,402, Cl. 47-1.00R.

Hiyama, Howard K.: *See*—
Hiyama, Kazuo; Hiyama, Howard K.; and Hiyama, Dean H., 4,480,402, Cl. 47-1.00R.

Hiyama, Kazuo; Hiyama, Howard K.; and Hiyama, Dean H., to Hiyama Farms, Inc. Method and apparatus for plant culture. 4,480,402, Cl. 47-1.00R.

Hiyama, Tamejiro; and Nishide, Kiyoharu, to Sagami Chemical Research Center. Process for the preparation of a trifluorovinylsilane, and fluorine-containing polymer and process for its preparation. 4,481,366, Cl. 556-431.000.

Hobby, William M.; and Valdespino, Joseph M. Internal combustion engine. 4,480,595, Cl. 123-1.00A.

Hochiki Kabushiki Kaisha: *See*—
Honma, Hiroshi, 4,481,506, Cl. 340-630.000.

Hochmuth, Frank W. Steam generator with integral down-draft dryer. 4,480,557, Cl. 110-234.000.

Hocker, Jurgen; Merten, Rudolf; and Willenberg, Bernd, to Bayer Aktiengesellschaft. Sheet structures and fibers containing burr-shaped or fibrous, doped polyacetylene particles and process for the production thereof. 4,481,312, Cl. 524-40.000.

Hodd, Donald E.; and Bucher, Hans R., to Xedar Corporation. Signal processing system for chopper type pyroelectric camera. 4,481,535, Cl. 358-113.000.

Hodgman, Rick K.: *See*—
Chen, Yung J.; and Hodgman, Rick K., 4,481,527, Cl. 357-23.000.

Hoechst Aktiengesellschaft: *See*—
Eckner, Gunter, 4,481,239, Cl. 428-36.000.
Fleischer, Dietrich; Weber, Eckhard; and Brandrup, Johannes, 4,481,333, Cl. 525-192.000.
Harreus, Albrecht; Kaiser, Eduard; Seip, Detlev; and Zimmermann, Wolfgang, 4,481,328, Cl. 524-493.000.
Hesse, Wolfgang; Ritz, Jurgen; and Zimmermann, Rolf, 4,481,311, Cl. 523-424.000.
Kleiner, Hans-Jerg, 4,481,151, Cl. 260-543.00P.
Leupold, Ernst I.; Schmidt, Hans-Joachim; and Popp, Knut, 4,481,146, Cl. 260-410.90R.
Marten, Manfred; and Becker, Wilhelm, 4,481,349, Cl. 528-120.000.
Wunder, Friedrich; Leupold, Ernst I.; and Litterer, Heinz, 4,481,376, Cl. 585-640.000.

Hoffman, Carl S. Orthodontic occlusion prevention system. 4,480,994, Cl. 433-6.000.

Hoffman, Charles R.; and Stephens, Geoffrey B., to International Business Machines Corporation. On chip charge trap compensated high voltage converter. 4,481,566, Cl. 363-60.000.

Hoffman, Charles T., Jr., to General Motors Corporation. Disc brake caliper mounting suspension. 4,480,724, Cl. 188-73.450.

Hoffman, Paul H. Fuel vaporizer. 4,480,622, Cl. 123-557.000.

Hoffmann, Gerhard: *See*—
Eckell, Albrecht; Eilingsfeld, Heinz; Elzer, Albert; Feichtmayr, Franz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,481,272, Cl. 430-58.000.

Hoffmann-La Roche Inc.: *See*—
Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, 4,481,142, Cl. 260-243.300.

Hofmann Corporation Automotive Service Equipment: *See*—
Wood, John F., 4,480,472, Cl. 73-462.000.

Hofmann, Dieter: *See*—
Albrecht, Wolfgang; Hofmann, Dieter; Klein, Lutz; and Panofski, Ernst, 4,481,442, Cl. 313-493.000.

Hofmann KG Brockhagen: *See*—
Hormann, Michael, 4,480,863, Cl. 292-216.000.

Hofmann, Peter, to Chemische Werke Huls AG. Process for preparing alkylesters of saturated aliphatic carboxylic acids. 4,481,147, Cl. 260-410.90R.

Hohne, Hans-Jurgen; and Mista, Kresimir, to Karl Mayer Textilmaschinenfabrik GmbH. Electromagnetically controllable coupling means for the drive shaft of a textile machine. 4,480,664, Cl. 139-76.000.

Holgado, Rosauro V., to E.F. Houghton & Co. Water-based hydraulic fluid. 4,481,125, Cl. 252-75.000.

Holladay, John H.; and Marlin, Robert V., to Cumberland Corporation. Apparatus for raising poultry utilizing high density brooding. 4,480,588, Cl. 119-17.000.

Holland, Bobby H. Highway information system. 4,481,584, Cl. 364-424.000.

Holland Company: *See*—
Murphy, Richard F., 4,480,721, Cl. 188-52.000.

Holleck, Helmut; Thuemmler, Fritz; and Prakash, Leo, to Kernforschungszentrum Karlsruhe GmbH. Wear resistant hard metal free of tungsten carbide. 4,481,166, Cl. 419-16.000.

Holley, Patrick C., to Hydril Company. Kelly cock rotary drive mechanism. 4,480,813, Cl. 251-288.000.

Holmes, Paul M., to Aeroquip Corporation. Braking actuator. 4,480,530, Cl. 92-78.000.

Holt, Kevin E.: *See*—
Andrews, Errol F.; Peterson, Edward A.; Casbolt, Jeffrey N.; Holt, Kevin E.; McMillan, John M.; and Whiting, Robert E., 4,480,955, Cl. 414-723.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; Matsuda, Minoru; and Shinozaki, Takashi, 4,480,712, Cl. 180-219.000.
Nakano, Yoshikatsu; and Matsuura, Masaaki, 4,480,617, Cl. 123-432.000.
Oyama, Kazuo, 4,480,847, Cl. 280-270.000.
Sato, Makoto; Miyakawa, Yoshitaka; Fujii, Etsuo; and Matsuda, Shohei, 4,480,876, Cl. 303-103.000.
Satoh, Kazuo; and Kawasaki, Katsuyoshi, 4,480,711, Cl. 180-215.000.
Tsuboi, Masaharu, 4,480,603, Cl. 123-90.310.
Yoshioka, Teruo; Miyazawa, Toshio; Uchida, Kuninobu; and Asai, Akimichi, 4,480,383, Cl. 29-822.000.

Honeywell Inc.: *See*—
Broberg, Theodore W.; and Rathe, David D., 4,481,635, Cl. 372-94.000.
Del Monte, Lou A., 4,481,403, Cl. 219-209.000.
Wilwerding, Dennis J., 4,481,413, Cl. 250-204.000.

Honeywell Information Systems Inc.: *See*—
Beauchesne, Robert C.; and Russell, Robert J., 4,481,627, Cl. 371-21.000.
Coppelman, Maurice A., 4,480,885, Cl. 339-45.00M.
Pasquinelli, Rossano, 4,481,628, Cl. 371-28.000.
Staggs, Kevin P.; Clarke, Charles J., Jr.; and Huntington, James C., 4,481,594, Cl. 364-521.000.

Honma, Hiroshi, to Hochiki Kabushiki Kaisha. Photoelectric smoke sensor. 4,481,506, Cl. 340-630.000.

Honma, Shigeo, to Mitsubishi Paper Mills, Ltd. Method for manufacturing photographic support. 4,481,289, Cl. 430-532.000.

Hoodbhoy, Samir A., to Kurt Manufacturing Company, Inc. Feedback system for robot controller. 4,481,569, Cl. 364-183.000.

Hopkins, John R.; and Ritchie, Leon T., to AMP Incorporated. Multi terminal low insertion force connector. 4,480,888, Cl. 339-74.00R.

Hoppel, Rainer, to Robert Bosch GmbH. Control apparatus for a fuel metering system in an internal combustion engine. 4,480,621, Cl. 123-493.000.

Hori, Shinichi; Ohnishi, Yasuichi; and Ono, Makoto, to Nippondenso Co., Ltd. Automatic control system for prime movers. 4,481,425, Cl. 290-51.000.

Horiuchi, Masami: *See*—
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,480,684, Cl. 165-110.000.

Hormann, Michael, to Hofmann KG Brockhagen. Door with locking device. 4,480,863, Cl. 292-216.000.

Hornung, Adolf, to Maschinenbau Oppenweiler Binder GmbH & Co. Folding machine. 4,481,007, Cl. 493-444.000.

Horrwarth, Ernst; Schweikert, Karl; and Weckerle, Hans J., to Robert Bosch GmbH. Mounting arrangement for electromotor. 4,480,380, Cl. 29-736.000.

Horujko, Mark P.: *See*—
Owen, Louis L.; Horujko, Mark P.; and Bools, William G., 4,481,553, Cl. 361-93.000.

Hosaka, Sumio: *See*—
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, 4,480,910, Cl. 355-30.000.

Hosaka, Toshihito: *See*—
Okamoto, Katsunari; Hosaka, Toshihito; Sasaki, Yutaka; Noda, Juichi; and Edahiro, Takao, 4,480,897, Cl. 350-96.300.

Hosooka, Akio: *See*—
Saito, Toyokazu; Sanmiya, Seietsu; Hosooka, Akio; Takashima, Kazuo; and Tanaka, Minoru, 4,481,534, Cl. 358-107.000.

Houk, William R.; and Rao, Hayagriva V., to Fairchild Camera & Instrument Corp. Power supply threshold activation circuit. 4,481,430, Cl. 307-296.00R.

House, Ronnalee; and Kellams, Roger W., to General Motors Corporation. Method of making an ignition coil core. 4,480,377, Cl. 29-593.000.

Hoxan Corporation: *See*—
Kaneta, Hiroshi; Sakao, Nobuo; and Kuraoka, Yasuo, 4,480,682, Cl. 165-14.000.

Hoy, Malcolm G.; and Ball, Michael M., to Aluminum Company of America. Multi-position plate welding using modified double-J joint. 4,481,402, Cl. 219-137.00R.

Hoya Corporation: *See*—
Tajima, Hidemi, 4,481,299, Cl. 501-73.000.

HPS Corporation: *See*—
Peacock, Roy N., 4,480,659, Cl. 137-630.120.

HR Textron Inc.: *See*—
Whisenand, Neal; and Tauber, Richard, 4,480,464, Cl. 73-40.000.

Hubbard, John S., Sr. Variably extensible waistband structure. 4,480,339, Cl. 2-237.000.

Hubbard, Winchester L.; and Moore, Richard C., to Uniroyal, Inc. Control of corn rootworm by application of N-methyl 2-(1-methylethyl)phenylcarbamate. 4,481,216, Cl. 424-300.000.

Huber, Johann, to Knorr-Bremse GmbH. Accelerator for control valves, especially for triple pressure control valves in pneumatic brake systems or rail vehicles. 4,480,875, Cl. 303-38.000.

Huffman, Ronald E., to KV33 Corporation. Flexible mold for dental model bases and method of using it. 4,481,162, Cl. 264-334.000.

Huffman, William F.: *See*—
Ali, Fadia E.; and Huffman, William F., 4,481,193, Cl. 424-177.000.
Ali, Fadia E.; and Huffman, William F., 4,481,194, Cl. 424-177.000.

Hughes Aircraft Company: *See*—
Wirick, Michael P.; and Wright, James P., 4,480,372, Cl. 29-458.000.

Hughes, Jodie K.; and Hagiwara, Sekine, to Pitney Bowes Inc. Direct memory access data transfer system for use with plural processors. 4,481,578, Cl. 364-200.000.

Hughes Tool Company: *See*—
Barthel, Horst K. F., 4,481,121, Cl. 252-8.50M.

Hughes, William E.: *See*—
Kaufman, Harold R.; Robinson, Raymond S.; and Hughes, William E., 4,481,062, Cl. 156-345.000.

Hughes, William F.: *See*—
Young, Frederick J.; Hughes, William F.; Deis, Daniel W.; and McNab, Ian R., 4,480,523, Cl. 89-8.000.

Hujiki, Tatsunori: *See*—
Fujisawa, Nobuhiko; Tanibe, Shozo; and Hujiki, Tatsunori, 4,480,545, Cl. 101-183.000.

Humblot, Bernard, to Steelweld France. Process for welding coated plates. 4,481,401, Cl. 219-91.200.

Hunter Douglas Inc.: *See*—
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Brugman, Johannes A.; and Hennequin, Petrus J., 4,480,360, Cl. 24-295.000.

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Staggs, Kevin P.; Clarke, Charles J., Jr.; and Huntington, James C., 4,481,594, Cl. 364-521.000.

Huntley, Christopher R., to AEL Microtel, Ltd. Modulator utilizing high and low frequency carriers. 4,481,490, Cl. 332-41.000.

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Hurt, Alvin G.; and Tilly, Lynn K., to McConway & Torley Corporation. Railway coupler arrangement. 4,480,758, Cl. 213-54.000.

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Hutchens, Richard E.: *See*—
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Hutchins, Gudrun: *See*—
Chen, Chia-Tien; and Hutchins, Gudrun, 4,481,084, Cl. 204-42.000.

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Kruger, Wolfgang; and Huther, Werner, 4,480,956, Cl. 416-97.00A.

Hydary, Mainul H. Automatic wire stripper. 4,480,509, Cl. 81-9.50A.

Hydril Company: *See*—
Holley, Patrick C., 4,480,813, Cl. 251-288.000.

Hyperion, Inc.: *See*—
Harter, James R.; and Freeman, Gary M., 4,480,467, Cl. 73-204.000.

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Lague, Gerald; Baldur, Roman; Marois, Paul; Brossard, Maurice; Quevillon, Marc; Di Franco, Enrico; and Dugre, Robert, 4,480,586, Cl. 119-15.000.

i f m electronic GmbH: *See*—
Buck, Robert; and Lichte, Norbert, 4,481,559, Cl. 361-395.000.

IBC Transport Containers, Ltd.: *See*—
Platt, Nigel D., 4,480,766, Cl. 222-105.000.

Ibrahimpasic, Ibrahim. Device for dressing grinding wheels. 4,480,626, Cl. 125-11.0DF.

Ibuchi, Yoshiaki: *See*—
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Ichikawa, Yoshio; and Umetsu, Shinjiro, to Nippon Electric Co., Ltd. Pulse detecting circuit of receiver for use in digital radio communication system. 4,481,675, Cl. 455-343.000.

ICI Australia Limited: *See*—
Markus, Michael V.; and Barnett, George H., 4,481,306, Cl. 521-31.000.

Ide, Jushi: *See*—
Fukunaga, Yasushi; Bandoh, Tadaaki; Matsumoto, Hidekazu; Hiraoka, Ryosei; Ide, Jushi; Kato, Takeshi; and Kawakami, Tetsuya, 4,481,573, Cl. 364-200.000.

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Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,480,597, Cl. 123-51.0BA.

Igarashi, Toshiji: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,481,217, Cl. 424-311.000.

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Iino, Shinji; Nakamura, Akihiko; Maruyama, Kensaku; and Nakamura, Kohji, to Mitsui Toatsu Chemicals, Inc. Process for preparing apatite. 4,481,175, Cl. 423-308.000.

Imai, Masao: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yokote, Sachio; Sekiguchi, Katsumi; Sasagawa, Katsuyoshi; and Imai, Masao, 4,481,131, Cl. 252-511.000.

Imajyo, Minoru: *See*—
Tange, Shoji; Imajyo, Minoru; Inoue, Ryuzaburo; and Nakagawa, Yasuhiko, 4,480,620, Cl. 123-478.000.

Imamura, Junji; and Matsumura, Kaname, to Mitsuboshi Belting Ltd. Power transmission belt manufacture. 4,481,051, Cl. 156-137.000.

Imamura, Shuichiro; and Arakawa, Akira, to Nissan Motor Company, Limited. Weft-bar (set mark) prevention system for a loom. 4,480,665, Cl. 139-97.000.

Inaba, Hajimu; Ono, Yukio; and Hiraizumi, Mitsuo, to Fujitsu Fanuc Limited. Numerical control method and apparatus. 4,481,568, Cl. 364-167.000.

Inai, Yuichi: *See*—
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Industra Products, Inc.: *See*—
Witwer, Keith A., 4,480,379, Cl. 29-596.000.

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Bianchi, Giuseppe; and Milocco, Claudio, 4,481,086, Cl. 204-78.000.

Ingersoll-Rand Company: *See*—
Luthi, Oscar, 4,480,392, Cl. 34-10.000.

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Inglee, Clinton F., to Boeing Company, The. Infrared energy detection device. 4,481,417, Cl. 250-338.000.

Ingvast, Hakan; and Karlsson, Bo, to AB Hagglund & Soner. Marshalling yard retarder. 4,480,723, Cl. 188-62.000.

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Barcelow, David M.; Callahan, John R.; and Johnson, Michael T., 4,480,833, Cl. 273-85.00B.

Innovative Molding Technology Inc. (Imtech): *See*—
Koffler, Thomas, 4,480,351, Cl. 15-187.000.

Inoue, Akira: *See*—
Yano, Mitsuru; and Inoue, Akira, 4,480,849, Cl. 280-433.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,480,490, Cl. 74-401.000.
Inoue, Kiyoshi, 4,481,095, Cl. 204-224.00M.

Inoue, Kazuo; Matsuda, Minoru; and Shinozaki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Supercharger apparatus in motorized two-wheeled vehicle. 4,480,712, Cl. 180-219.000.

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Inoue, Shingo: *See*—
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Inoue, Tokunari: *See*—
Hiramatsu, Rihei; Takeshita, Ko; and Inoue, Tokunari, 4,481,461, Cl. 323-272.000.

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Institut Francais du Petrole: *See*—
Delamare, Guy R., 4,480,575, Cl. 114-230.000.

Institut Nationale de la Sante et de la Recherche Medicale: *See*—
Cazaubon, Catherine; Diaz, Joseph; Guegan, Remy; Castro, Bernard; Evin, Genevieve; Corvol, Pierre; and Gagnol, Jean-Pierre, 4,481,192, Cl. 424-177.000.

Institut Organicheskogo Sinteza Akademii Nauk Latviiskoi SSR: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.

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Zhukov, Leonid F.; Chugunny, Evgeny G.; Shumikhin, Vladimir S.; Kucherenko, Sergei V.; Zhelnis, Mechislav V.; and Zemlyavichus, Pranas V., 4,480,820, Cl. 266-44.000.

Instrumentarium Oy: *See*—
Kinanen, Ilmari, 4,481,650, Cl. 378-7.000.

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Anderson, Nathaniel C.; Chesnut, Robert B.; and Daby, Larry E., 4,481,071, Cl. 156-656.000.
Babuka, Robert; Burke, Andrea; and Haiges, Paul E., *Jr.*, 4,480,884, Cl. 339-17.00L.
Bazlen, Dieter; Hajdu, Johann; and Knauft, Gunter, 4,481,575, Cl. 364-200.000.
Bohrer, Kathryn A.; and Edgar, Albert D., 4,481,602, Cl. 364-900.000.
Bouldin, Dennis P.; Hallock, Dale P.; Roberts, Stanley; and Ryan, James G., 4,481,046, Cl. 148-188.000.
Compton, John I., 4,481,473, Cl. 324-423.000.
Cottrell, Peter E.; and Geipel, Henry J., Jr., 4,480,375, Cl. 29-576.00B.
Franey, Terence E.; Watkins, Richard B.; and Woolfolk, Austin W., 4,481,255, Cl. 428-355.000.
Godard, Dominique, 4,481,646, Cl. 375-77.000.
Herman, Richard L., 4,480,934, Cl. 400-124.000.
Hoffman, Charles R.; and Stephens, Geoffrey B., 4,481,566, Cl. 363-60.000.
Linger, Claude J. A.; and Locicero, Gisele C., 4,481,664, Cl. 382-8.000.
McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., 4,481,603, Cl. 364-900.000.
Polk, Darryl R.; and Southworth, Richard A., 4,480,938, Cl. 400-322.000.

International Coal Refining Company: *See*—
Lennon, Dennis R., 4,480,560, Cl. 110-342.000.

International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,480,646, Cl. 131-276.000.
Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,481,225, Cl. 426-538.000.
Boden, Richard M.; Temes, Steven D.; and Tyszkiewicz, Theodore J., 4,481,372, Cl. 568-378.000.
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,481,221, Cl. 426-3.000.
Muralidhara, Ranya; Pittet, Alan O.; Vock, Manfred H.; and Bowen, David R., 4,481,224, Cl. 426-535.000.
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., 4,480,647, Cl. 131-276.000.
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Riise, Morris M., 4,481,114, Cl. 210-702.000.

International Standard Electric Corporation: *See*—
Rose, Jochen, 4,481,386, Cl. 200-11.00R.
International Telephone and Telegraph Corporation: *See*—
Herrick, Franklin W., 4,481,076, Cl. 162-158.000.
Herrick, Franklin W., 4,481,077, Cl. 162-158.000.
Ponzi, Joseph J., 4,480,461, Cl. 73-32.00A.
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Roth, James E., 4,481,411, Cl. 219-532.000.
Inui, Toshiharu; Moriguchi, Fujio; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Transfer type heat-sensitive recording device. 4,481,518, Cl. 346-76.0PH.
Invernizzi, Renzo; and Ligorati, Ferdinando, to Anic S.p.A. Method of preparing low-density ethylene copolymers. 4,481,342, Cl. 526-125.000.
Ioannidis, Kostas P.; and Stone, David E., to Radx Corporation. Camera for CRT monitor. 4,481,541, Cl. 358-244.000.
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Buchele, Wesley F., 4,480,481, Cl. 73-784.000.
Iseki, Masahide; Nakajima, Tadanobu; Kajita, Hiroshi; and Kawamoto, Masuo, to Mita Industrial Company Ltd. Method of preventing toner from scattering in an electrostatic copying machine. 4,481,275, Cl. 430-125.000.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,480,448, Cl. 68-5.00E.
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Ishii, Keizou; Mizuguchi, Ryuzo; Ishikura, Shinichi; and Yoshioka, Tamotsu, to Nippon Paint Co., Ltd. Process for preparing hydroxyalkylaminosulfonic acids. 4,481,150, Cl. 260-513.00N.
Ishii, Yoshihiro: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, 4,481,053, Cl. 156-157.000.
Ishikawa, Hiromi, to Fuji Photo Film Co., Ltd. Light beam deflecting apparatus. 4,480,892, Cl. 350-3.710.
Ishikawa, Norikatsu; and Furusawa, Choji, to Aisin Seiki Kabushiki Kaisha. Hydraulically operative clutch type transmission. 4,480,734, Cl. 192-20.000.
Ishikawa, Shun-ichi; Tamoto, Koji; Iwasaki, Masayuki; and Umehara, Akira, to Fuji Photo Film Co., Ltd. Photopolymerizable composition containing a combination of photoinitiators. 4,481,276, Cl. 430-281.000.
Ishikura, Shinichi: *See*—
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Ishiwata, Junichi, to Canon Kabushiki Kaisha. Electronic equipment having a second function keying system. 4,481,598, Cl. 364-710.000.
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Sugimoto, Osamu; Ishizaka, Shinobu; Tanaka, Youji; and Suzuki, Noboru, 4,481,455, Cl. 318-778.000.
Ishizu, Junichi: *See*—
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Ishizuka, Yutaka, to Diesel Kiki Co., Ltd. Vane compressor provided with endless camming surface minimizing torque fluctuations. 4,480,973, Cl. 418-150.000.
Itakura, Tomiya: *See*—
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, 4,480,618, Cl. 123-438.000.
Itaya, Masahiko; Haneda, Satoshi; and Tomono, Makoto, to Konishiroku Photo Industry Co., Ltd. Developing apparatus and a developing method of an electrostatic image. 4,480,911, Cl. 355-3.0DD.
Ito, Katuhiko: *See*—
Togawa, Tsuyoshi; Nakamoto, Teruyuki; Iwata, Mitsuo; Ito, Katuhiko; Sano, Hideo; Sekine, Nobutaka; and Shibuya, Tomoe, 4,480,981, Cl. 425-143.000.
Ito, Mitsuko: *See*—
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Ito, Shigeyuki; Watatani, Yoshizumi; and Owashi, Hitoaki, to Hitachi, Ltd. Modulator-demodulator for obtaining and demodulating frequency-modulated signal. 4,481,546, Cl. 360-30.000.
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Itoh, Masaru, to Toyoda Gosei Co., Ltd. Method for rubber vulcanization by dielectric heating. 4,481,159, Cl. 264-26.000.
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Kamikura, Shigeo; and Itoh, Takeshi, 4,480,931, Cl. 400-63.000.
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Nakai, Mamoru; Ohshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, 4,481,362, Cl. 548-498.000.
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Yamamori, Takahiro; and Iwanaga, Kazuyoshi, 4,480,500, Cl. 74-713.000.
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Iwata, Mitsuo: *See*—
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Jackovitz, John F.; and Pantier, Earl A., to Westinghouse Electric Corp. Alkali slurry ozonation to produce a high capacity nickel battery material. 4,481,128, Cl. 252-182.100.
Jackson, Francis B.: *See*—
Sullivan, Robert P.; and Jackson, Francis B., 4,480,594, Cl. 122-510.000.
Jacobs, Henry W.; and Althaus, Stephen E., to Texas Instruments Incorporated. Calibration system for a programmable manipulator. 4,481,592, Cl. 364-513.000.
Jacobs, Richard W., to Bemis Company, Inc. Pinch closure bags with opening feature and method of manufacturing them. 4,480,752, Cl. 206-632.000.
Jacques, Robert L.: *See*—
Tsai, Lung-Wen; and Jacques, Robert L., 4,480,607, Cl. 123-192.00B.
Jamgochian, Herbert H.; and Levasseur, Joseph L., to ARA Services, Inc. Apparatus for recognizing, crushing separating, weighing and making payment for, used metal items, particularly aluminum cans. 4,480,737, Cl. 194-4.00C.
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Makabe, Hachiro; Tanaka, Haruhiko; Orii, Akira; and Kongoh, Takeshi, 4,480,561, Cl. 112-158.00E.
Janssen, Jozef T. A.; and Schijvens, Antonius W. M., to U.S. Philips Corporation. Medical apparatus. 4,481,656, Cl. 378-196.000.
Janutka, William J., to Eaton Corporation. Self regenerative fast gate turn-off FET. 4,481,434, Cl. 307-570.000.
Jarosz, John M.; and Panas, William R., to S&C Electric Company. Fusible element for a current-limiting fuse having groups of spaced holes or notches therein. 4,481,495, Cl. 337-159.000.
Jaskowski, Michael C., to Helmic, Inc. Method for degumming decorticated plant bast fiber. 4,481,355, Cl. 536-2.000.
Jastrzebski, Lubomir L.; and Levine, Peter A., to RCA Corporation. CCD Imagers with substrates having drift field. 4,481,522, Cl. 357-24.000.
Jaxmar, Leif; and Alfred, Allan, to Frigoscandia Contracting AB. Apparatus for air-treatment of products. 4,480,535, Cl. 99-476.000.
Jeblick, Werner: *See*—
Bruck, Dieter W.; Jeblick, Werner; and Ruetz, Lothar, 4,481,321, Cl. 524-243.000.
Jellinek, Frank H.: *See*—
Melisz, John M.; and Jellinek, Frank H., 4,481,246, Cl. 428-210.000.
Jenne, Gustav. Control device for forward and backward travel of automatic pneumatic percussion boring devices. 4,480,525, Cl. 91-25.000.
Jeremias, Robert W. Non-burring drill for composite materials. 4,480,952, Cl. 408-224.000.
Jervis B. Webb Company: *See*—
Dehne, Clarence A., 4,480,743, Cl. 198-845.000.
Jeschke, Willi, to Heidelberger Druckmaschinen. Device for ink profile-dependent regulation of dampening medium. 4,480,542, Cl. 101-148.000.
Jeschke, Willi; and Junghans, Rudi, to Heidelberger Druckmaschinen Aktiengesellschaft. Ink duct for offset or letterpress printing machines. 4,480,547, Cl. 101-363.000.
Jie-cheng, Xu: *See*—
Folkers, Karl; and Jie-cheng, Xu, 4,481,139, Cl. 260-112.50R.
Jines, Mike D.: *See*—
Macht, Jon A.; and Jines, Mike D., 4,480,713, Cl. 180-268.000.
John Wyeth & Brother, Limited: *See*—
Ward, Terence J.; and White, John F., 4,481,200, Cl. 424-248.500.
Johnson, Courtenay P., to Northern Telecom Limited. Sequence control circuit for a computer. 4,481,581, Cl. 364-200.000.
Johnson, Gary W.; Schoonejongen, Ronald J.; and Hilson, David G., II, to Electro Materials Corp. of America. Blister-resistant dielectric. 4,481,261, Cl. 428-434.000.
Johnson, J. Wallace, to Liquid Level Lectronics, Inc. Magnetic control device. 4,481,389, Cl. 200-84.00C.
Johnson & Johnson Dental Products Company: *See*—
Panzera, Carlino, 4,481,036, Cl. 106-35.000.
Johnson, Kalin S.; and Alsobrooks, Daniel E., to Colt Industries Operating Corp. Throttle assembly. 4,480,367, Cl. 29-157.10R.

Johnson, Marvin M.: *See*—
McDaniel, Max P.; and Johnson, Marvin M., 4,481,302, Cl. 502-150.000.
Johnson, Michael T.: *See*—
Barcelow, David M.; Callahan, John R.; and Johnson, Michael T., 4,480,833, Cl. 273-85.00B.
Johnson, Robert L. Plumbing fixture. 4,480,656, Cl. 137-215.000.
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Kautz, Thomas O.; and Duenkel, Gerald A., 4,481,451, Cl. 318-628.000.
Johnston, David B. R., to Merek & Co., Inc. 2-Amino-3-carboxylate-5-halo-6-(substituted)pyrazine antimicrobial compounds. 4,481,202, Cl. 424-250.000.
Jones, Edwin L.: *See*—
Harper, Allan C.; Jones, Edwin L.; and Beaver, Ivan D., 4,480,440, Cl. 60-605.000.
Jones, Gregory R., to Drackett Company, The. Passive dispenser. 4,480,342, Cl. 4-228.000.
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Rosenfield, Norman A.; Rosenfield, Paul M.; and Jones, Robert H., 4,480,570, Cl. 114-106.000.
Jones, Thomas M.: *See*—
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Jorn, Ernest; and Rostrup-Nielsen, Jens R., to Haldor Topsoe A/S. Process for the preparation of hydrocarbons. 4,481,305, Cl. 518-705.000.
Joseph B. Stinson Co.: *See*—
Stinson, Joseph B., 4,480,610, Cl. 123-196.00S.
Joyner, Frederick B.: *See*—
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McConnell, Richard L.; Trotter, Jimmy R.; and Joyner, Frederick B., 4,481,352, Cl. 528-302.000.
Judkins, Thomas E.; and Stanton, Thomas J. Fastener strip for building wall constructions. 4,480,416, Cl. 52-376.000.
Junghans, Rudi: *See*—
Jeschke, Willi; and Junghans, Rudi, 4,480,547, Cl. 101-363.000.
Jurgens, Erwin: *See*—
von Hagen, Wolf R.; and Jurgens, Erwin, 4,480,562, Cl. 112-200.000.
K-Sun Corporation: *See*—
Kasun, Michael J.; and Shaffer, David C., 4,480,936, Cl. 400-207.000.
Kabakoff, Bruce D.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Chu, John Y.; and Kabakoff, Bruce D., 4,481,198, Cl. 424-236.000.
Kabushiki Kaisha Furukawa Seisakusho: *See*—
Furukawa, Takao, 4,480,425, Cl. 53-509.000.
Kabushiki Kaisha Johnan Seisakusho: *See*—
Hara, Yoshiji, 4,480,409, Cl. 49-352.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Fujiwara, Kazuo; Sugie, Kiyoshi; and Uetani, Fujiko, 4,481,033, Cl. 75-128.00A.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Baba, Kiyokazu, 4,480,953, Cl. 414-27.000.
Kabushiki Kaisha Matsushiro: *See*—
Matsushiro, Yukimitsu, 4,480,401, Cl. 446-456.000.
Kabushiki Kaisha Medos Kenkyusho: *See*—
Enatsu, Masayuki, 4,480,479, Cl. 73-721.000.
Kabushiki Kaisha Meidensha: *See*—
Kashiwagi, Yoshiyuki; Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,481,390, Cl. 200-144.00B.
Kabushiki Kaisha Sato: *See*—
Shibayama, Tooru; and Kajiya, Hiroshi, 4,480,933, Cl. 400-120.000.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Ando, Takayuki, 4,480,804, Cl. 242-107.200.
Ando, Takayuki; and Mori, Shinji, 4,480,853, Cl. 280-801.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Anahara, Meiji; Suzuki, Yoshihisa; Takasu, Shigeru; and Omori, Hiroshi, 4,480,435, Cl. 57-333.000.
Hiroshi, Niimi; Meiji, Anahara; and Shigeru, Muramatsu, 4,480,434, Cl. 57-333.000.
Kono, Hiroya; Hasegawa, Jun; Deguchi, Hiroyuki; and Kobayashi, Hisao, 4,480,961, Cl. 417-15.000.
Kabushiki Kaisha Toyota ChuoKenkyuscho: *See*—
Hiroshi, Niimi; Meiji, Anahara; and Shigeru, Muramatsu, 4,480,434, Cl. 57-333.000.
Kabushiki Kaisha Yamada Dobby: *See*—
Yoshida, Akihiro, 4,480,538, Cl. 100-48.000.
Kaiser, Eduard: *See*—
Harreus, Albrecht; Kaiser, Eduard; Seip, Detlev; and Zimmermann, Wolfgang, 4,481,328, Cl. 524-493.000.
Kaiser, Joseph G., to Pfizer Inc. Process for adding calcium to a bath of molten ferrous material. 4,481,032, Cl. 75-58.000.
Kajita, Hiroshi: *See*—
Iseki, Masahide; Nakajima, Tadanobu; Kajita, Hiroshi; and Kawamoto, Masuo, 4,481,275, Cl. 430-125.000.
Kajiya, Hiroshi: *See*—
Shibayama, Tooru; and Kajiya, Hiroshi, 4,480,933, Cl. 400-120.000.
Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo , 4,481,204, Cl. 424-262.000.
Kalfs, Johannes J. W., to U.S. Philips Corporation. Arrangement for cancelling echo signals. 4,481,385, Cl. 179-170.200.
Kalk, Philippe; Poilblanc, Rene ; and Gaset, Antoine, to Produits Chimiques Ugine Kuhlmann. Binuclear rhodium complex as a hydroformylation and hydrogenation catalyst. 4,481,375, Cl. 568-454.000.
Kalvinsh, Ivars Y.: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.
Kamei, Fumio; and Yanagiuchi, Shigenobu, to Sharp Kabushiki Kaisha. Input device with a reduced number of keys. 4,481,508, Cl. 340-712.000.
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Apparatus for enriching fuel upon engine starting operation. 4,480,618, Cl. 123-438.000.
Kamikura, Shigeo; and Itoh, Takeshi, to Silver Seiko, Ltd. Electronic typewriter. 4,480,931, Cl. 400-63.000.
Kaminsky, Didier: *See*—
Bert, Alain; and Kaminsky, Didier, 4,481,486, Cl. 331-99.000.
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Okumura, Takeshi, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine with helical intake port and combustion chamber with two squish areas. 4,480,625, Cl. 123-661.000.
Kanda, Shoichi; and Kawamura, Gengiro, to Nitto Chemical Industry Co., Ltd. Method for inhibiting the degradation of an aqueous solution of an acrylamide polymer in a petroleum recovery process. 4,481,316, Cl. 524-93.000.
Kanda, Yoichi: *See*—
Aoki, Katsumichi; Kanda, Yoichi; Shida, Takafumi; Satake, Keigo; and Shinkawa, Hiroyasu, 4,481,027, Cl. 71-90.000.
Kanebo, Ltd.: *See*—
Kondo, Mitsuo; Minamino, Hiromi; Otani, Yasuhisa; Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, 4,481,187, Cl. 424-63.000.
Masuda, Yugoro; Nonaka, Toyokazu; and Kawase, Shigeru, 4,481,256, Cl. 428-362.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Somemiya, Akiyoshi; Miyashita, Shunichu; and Ishizu, Junichi, 4,481,332, Cl. 525-132.000.
Kaneko, Katsumi: *See*—
Okumura, Yoshiharu; Sakakibara, Tadamori; and Kaneko, Katsumi, 4,481,373, Cl. 568-401.000.
Kaneko, Midori, to Hamada Printing Press Mfg. Co., Ltd. Paper feeder. 4,480,826, Cl. 271-103.000.
Kaneko, Takashi: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,481,334, Cl. 525-211.000.
Kaneta, Hiroshi; Sakao, Nobuo; and Kuraoka, Yasuo, to Hoxan Corporation. Apparatus for freezing fertilized ova, spermatozoa or the like. 4,480,682, Cl. 165-14.000.
Kaneyasu, Masayoshi: *See*—
Arima, Hideo; Kaneyasu, Masayoshi; and Ito, Mitsuko, 4,481,499, Cl. 338-34.000.
Kannemeier & Koch GmbH: *See*—
Conrad, Ulrich, 4,480,427, Cl. 54-6.00R.
Kanner, Bernard: *See*—
Chu, Nan S.; Kanner, Bernard; and Schilling, Curtis L., Jr., 4,481,364, Cl. 556-413.000.
Kapetanakos, Christos A.; and Sprangle, Phillip, to United States of America, Navy. Betatron accelerator having high ratio of Budker parameter to relativistic factor. 4,481,475, Cl. 328-237.000.
Kaplunov, Iosif B., deceased: *See*—
Milovidov, Boris A.; and Kaplunov, Iosif B., deceased, 4,481,168, Cl. 422-78.000.
Kaplunova, Nadezhda V., administrator: *See*—
Milovidov, Boris A.; and Kaplunov, Iosif B., deceased, 4,481,168, Cl. 422-78.000.
Karabinis, Peter D., to AT&T Bell Laboratories. Linear distortion canceller circuit. 4,481,645, Cl. 375-58.000.
Karaki, Kouichi; Oinoue, Kenichi; Tsukaya, Takashi; Terada, Katsumi; Yamasaki, Masafumi; Yusa, Atsushi; and Nakamura, Kazuo, to Olympus Optical Co., Ltd. Endoscope with image correction means. 4,480,636, Cl. 128-6.000.
Karas, Edwin L.: *See*—
Thompson, Duane T.; Karas, Edwin L.; Root, Ernest F.; and Schlyter, Fredrik, 4,480,914, Cl. 356-346.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Hohne, Hans-Jurgen; and Mista, Kresimir, 4,480,664, Cl. 139-76.000.
Karlsson, Bo: *See*—
Ingvast, Hakan; and Karlsson, Bo, 4,480,723, Cl. 188-62.000.
Karolik, Ivan J.: *See*—
Alexandersen, John B.; and Karolik, Ivan J., 4,481,467, Cl. 324-72.500.
Karpati, Egon: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo , 4,481,204, Cl. 424-262.000.
Kashimoto, Yutaka: *See*—
Kashiwagi, Yoshiyuki; Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,481,390, Cl. 200-144.00B.
Kashiwagi, Yoshiyuki; Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, to Kabushiki Kai-

sha Meidensha. Vacuum circuit interrupter. 4,481,390, Cl. 200-144.00B.

Kastenhuber, Manfred: *See*—
Eckel, Alfred; Kastenhuber, Manfred; and Bock, Erich, 4,480,552, Cl. 102-393.000.

Kasuga, Akira: *See*—
Matsufuji, Akihiro; Umemura, Shizuo; Kasuga, Akira; Miyatuka, Hajime; and Akashi, Goro, 4,481,253, Cl. 428-323.000.

Kasun, Michael J.; and Shaffer, David C., to K-Sun Corporation. Two-piece tape/ribbon cartridge. 4,480,936, Cl. 400-207.000.

Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member and preparation thereof. 4,481,273, Cl. 430-59.000.

Kato, Hideaki: *See*—
Watanabe, Takashi; Sasage, Yoshihiro; and Kato, Hideaki, 4,481,450, Cl. 318-444.000.

Kato, Koji: *See*—
Izumida, Tatsuo; Kato, Koji; and Kawamura, Fumio, 4,481,089, Cl. 204-129.430.

Kato, Shinichi; Motosugi, Katsuhiko; Takimoto, Masatami; Yamada, Haruo; Mizuno, Kisaburo; and Teramura, Mitsuyoshi, to Toyota Jidosha Kabushiki Kaisha. Intake system of an internal combustion engine. 4,480,606, Cl. 123-188.00M.

Kato, Takeshi: *See*—
Fukunaga, Yasushi; Bandoh, Tadaaki; Matsumoto, Hidekazu; Hiraoka, Ryosei; Ide, Jushi; Kato, Takeshi; and Kawakami, Tetsuya, 4,481,573, Cl. 364-200.000.

Katoh, Mankichi, legal representative: *See*—
Hashimoto, Mitsuru; Sakai, Kiyoshi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, legal representative, 4,481,271, Cl. 430-57.000.

Katoh, Tatsuya, deceased: *See*—
Hashimoto, Mitsuru; Sakai, Kiyoshi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, legal representative, 4,481,271, Cl. 430-57.000.

Katoh, Tazuko, heir: *See*—
Hashimoto, Mitsuru; Sakai, Kiyoshi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, legal representative, 4,481,271, Cl. 430-57.000.

Katschinski, Ulrich, to Fried. Krupp GmbH. Chill mold for multiple continuous casting of wires and casting strands with small cross-sections from metal. 4,480,679, Cl. 164-420.000.

Kaufman, Harold R.; Robinson, Raymond S.; and Hughes, William E. Electron bombardment ion sources. 4,481,062, Cl. 156-345.000.

Kautz, Thomas O.; and Duenkel, Gerald A., to Johnson Service Company. Electronically controlled positioner for pneumatic actuators. 4,481,451, Cl. 318-628.000.

Kawaguchi, Hidemi: *See*—
Kashiwagi, Yoshiyuki; Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,481,390, Cl. 200-144.00B.

Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yokote, Sachio; Sekiguchi, Katsumi; Sasagawa, Katsuyoshi; and Imai, Masao, to Mitsui Toatsu Chemicals, Inc. Electroconductive resin composition. 4,481,131, Cl. 252-511.000.

Kawai, Yukio; Morishita, Michio; Otsuki, Hiromi; and Kondo, Takashi, to Nippondenso Co., Ltd. Air flow control valve means. 4,480,661, Cl. 137-544.000.

Kawakami, Tetsuya: *See*—
Fukunaga, Yasushi; Bandoh, Tadaaki; Matsumoto, Hidekazu; Hiraoka, Ryosei; Ide, Jushi; Kato, Takeshi; and Kawakami, Tetsuya, 4,481,573, Cl. 364-200.000.

Kawamoto, Masuo: *See*—
Iseki, Masahide; Nakajima, Tadanobu; Kajita, Hiroshi; and Kawamoto, Masuo, 4,481,275, Cl. 430-125.000.

Kawamura, Fumio: *See*—
Izumida, Tatsuo; Kato, Koji; and Kawamura, Fumio, 4,481,089, Cl. 204-129.430.

Kawamura, Gengiro: *See*—
Kanda, Shoichi; and Kawamura, Gengiro, 4,481,316, Cl. 524-93.000.

Kawamura, Masaharu, to Canon Kabushiki Kaisha. Camera having light measuring mode change-over device with safety circuit. 4,480,902, Cl. 354-434.000.

Kawamura, Shigeru, to Clarion Co., Ltd. Low distortion amplifier circuit. 4,481,483, Cl. 330-297.000.

Kawamura, Yoshio: *See*—
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, 4,480,910, Cl. 355-30.000.

Kawasaki Kasei Chemicals Ltd.: *See*—
Sakai, Kazuaki; Sato, Tuneyasu; and Chiba, Kazuhiko, 4,481,073, Cl. 162-30.100.

Kawasaki, Katsuyoshi: *See*—
Satoh, Kazuo; and Kawasaki, Katsuyoshi, 4,480,711, Cl. 180-215.000.

Kawasaki Steel Corporation: *See*—
Asano, Yuichiro; Suzuki, Taira; Yabe, Tadashi; Kurita, Kunio; Ohga, Suehisa; Hirahashi, Akira; and Momose, Atsushi, 4,480,919, Cl. 356-376.000.

Kawase, Shigeru: *See*—
Masuda, Yugoro; Nonaka, Toyokazu; and Kawase, Shigeru, 4,481,256, Cl. 428-362.000.

Kawashima, Sadao; and Takei, Heiichi, to Asahi Fiber Glass Company Limited. Core material for fiber reinforced plastic and process for its production. 4,481,241, Cl. 428-134.000.

Kawate, Kenji: *See*—
Suzuki, Seiji; Kawate, Kenji; and Tawara, Hiroshi, 4,480,777, Cl. 226-15.000.

Kaya, Azmi; and Lukas, Michael P., to Babcock & Wilcox Company, The. Adaptive process control using function blocks. 4,481,567, Cl. 364-157.000.

Kaye Instruments Inc.: *See*—
Townzen, David, 4,481,596, Cl. 364-571.000.

Kazama, Hisao; Nakanishi, Akito; and Nakayama, Katsuichi, to Sumitomo Metal Industries, Ltd. Method and apparatus for ultrasonic flaw detection of T-welded portion of steel product. 4,480,474, Cl. 73-600.000.

Kazor, Thomas R.; and Whitcomb, Jon P., to Motorola, Inc. Static shielded shipping container. 4,480,747, Cl. 206-334.000.

Kearney & Trecker Corporation: *See*—
Mattson, Clyde E., 4,480,738, Cl. 198-339.000.

Kehayov, Georgi S.: *See*—
Vassilev, Vassil B.; Sofiyanski, Vassil M.; Vassilev, Boris V.; Danchev, Panayot Y.; Angelov, Angel B.; Strandjaliev, Yordan M.; and Kehayov, Georgi S., 4,481,482, Cl. 330-297.000.

Keim, Thomas A., to Electric Power Research Institute, Inc. High voltage electrical generator and windings for use therein. 4,481,438, Cl. 310-201.000.

Keith, Donald G.; and Flecknoe-Brown, Anthony E., to A.A.R.C. (Management) Pty. Limited. Stretch forming hollow articles. 4,480,979, Cl. 425-403.000.

Kellams, Roger W.: *See*—
House, Ronnalee; and Kellams, Roger W., 4,480,377, Cl. 29-593.000.

Kelley, Jay H. Gob canopy for a mine roof support. 4,480,946, Cl. 405-293.000.

Kellner, Bernd. Solar collector. 4,480,634, Cl. 126-443.000.

Kelly, John, Jr., to Mobil Oil Corporation. Method and apparatus for drilling oil well and treating drilling mud. 4,480,702, Cl. 175-66.000.

Kemper, Franz, to Bergwerksverband GmbH. Water nozzle. 4,480,789, Cl. 239-116.000.

Kennedy, Clinton R.; and Krambeck, Frederick J., to Mobil Oil Corporation. Surge bin retorting solid feed material. 4,481,100, Cl. 208-11.00R.

Kerling, Jean-Marie, to U.S. Philips Corporation. Tricolor video signal generator, such as a video game, usable with a monochrome picture display device. 4,481,529, Cl. 358-30.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Holleck, Helmut; Thuemmler, Fritz; and Prakash, Leo, 4,481,166, Cl. 419-16.000.

Kerr, George; and Meheust, Yves, to U.S. Philips Corporation. Method of manufacturing an integrated capacitor and device obtained by this method. 4,481,283, Cl. 430-319.000.

Kerr-McGee Corporation: *See*—
Lehman, F. Allen; Sleffel, Willism M.; and Ray, Malcolm G., 4,481,503, Cl. 340-518.000.

Kerscher, Max: *See*—
Kroning, Armin; Kerscher, Max; and Krummel, Peter, 4,481,460, Cl. 323-266.000.

Khan, Karrar A.: *See*—
Utting, Kenneth; Khan, Karrar A.; and Callander, Sidney E., 4,481,209, Cl. 424-271.000.

Khanna, Pyare; and Ullman, Edwin F., to Syva Company. Alkyl substituted fluorescent compounds and conjugates. 4,481,136, Cl. 260-112.00R.

Khiller, Ida I., administratrix.: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.

Kiel, Bernd-Joachim: *See*—
Bergemann, Klaus-Dieter; Deike, Karl-Heinz; Kiel, Bernd-Joachim; and Konig, Heinz-Werner, 4,480,663, Cl. 137-627.500.

Kifferstein, Harry P. Muted rhythm indicating exercisers. 4,480,828, Cl. 272-70.000.

Killen, Samuel R. Test counter. 4,481,649, Cl. 377-19.000.

Kimberly-Clark Corporation: *See*—
Gerndt, Robert J., 4,480,772, Cl. 223-1.000.

Kimura, Tomio: *See*—
Nakai, Mamoru; Ohshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, 4,481,362, Cl. 548-498.000.

Kinanen, Ilmari, to Instrumentarium Oy. Installation for producing radiographic layer images. 4,481,650, Cl. 378-7.000.

Kindt, Robert J.: *See*—
Titus, Rex S.; Kindt, Robert J.; and Peffer, Robert M., 4,480,906, Cl. 355-3.00R.

King, Patrick F.; and Stroud, Stephen G., to Polaroid Corporation. Chrome complexed dye developer compounds and photographic products and processes. 4,481,278, Cl. 430-225.000.

King, Patrick F.; and Stroud, Stephen G., to Polaroid Corporation. Ligands and photographic process. 4,481,286, Cl. 430-441.000.

Kinghorn, John R., to U.S. Philips Corporation. Digital data apparatus having a plurality of selectively addressable peripheral units. 4,481,579, Cl. 364-200.000.

Kinney, William L., Jr.; and Evans, Richard E., Jr., to United Air Filter Company. Rotary drum air filter. 4,481,021, Cl. 55-290.000.

Kishimoto, Kazuo: *See*—
Ohara, Osamu; and Kishimoto, Kazuo, 4,481,330, Cl. 525-67.000.

Kishimoto, Shinzo; and Yamamuro, Kiyohiko, to Fuji Photo Film Co., Ltd. Color photographic silver halide light-sensitive materials. 4,481,290, Cl. 430-543.000.
Kitamura, Kenroh: *See—*
Naito, Jiro; Yoneda, Yasuhiro; and Kitamura, Kenroh, 4,481,279, Cl. 430-280.000.
Kitano, Kissho: *See—*
Newlove, John C.; Portnoy, Robert C.; Schulz, Donald N.; and Kitano, Kissho, 4,480,693, Cl. 166-293.000.
Kitano, Yuichi; and Tada, Yoshiharu, to Diesel Kiki Co., Ltd. Control circuit for electromagnetic devices. 4,481,452, Cl. 318-681.000.
Kitazawa, Hiroo, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic equalizer. 4,481,643, Cl. 375-12.000.
Kiya, Nobuyuki: *See—*
Nozawa, Ryoichiro; and Kiya, Nobuyuki, 4,481,606, Cl. 364-900.000.
Klein, Keith W.: *See—*
Heft, Eldon B.; and Klein, Keith W., 4,481,491, Cl. 335-21.000.
Klein, Lutz: *See—*
Albrecht, Wolfgang; Hofmann, Dieter; Klein, Lutz; and Panofski, Ernst, 4,481,442, Cl. 313-493.000.
Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Process for the preparation of dialkylphosphinic acid halides. 4,481,151, Cl. 260-343.00P.
Kleinschmit, Peter: *See—*
Baacke, Michael; and Kleinschmit, Peter, 4,481,174, Cl. 423-306.000.
Klemarczyk, Philip T.: *See—*
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., 4,480,647, Cl. 131-276.000.
Klemmer, Paul J.: *See—*
Agronin, Ronald D.; and Klemmer, Paul J., 4,480,537, Cl. 100-38.000.
Klier, Shimon; and Novik, Ofer, to Klier, Shimon. Light transmissive insulation apparatus. 4,480,632, Cl. 126-415.000.
Klockner-Werke AG: *See—*
Noll, Hans; Bangert, Wilfried; and Hacobs, Hans, 4,480,821, Cl. 266-54.000.
Knauft, Gunter: *See—*
Bazlen, Dieter; Hajdu, Johann; and Knauft, Gunter, 4,481,575, Cl. 364-200.000.
Knight, Paul A.: *See—*
Marshall, Barry R.; and Knight, Paul A., 4,480,657, Cl. 137-103.000.
Knopf, Robert J., to Union Carbide Corporation. High viscosity poly-oxyalkylene glycol block copolymers and method of making the same. 4,481,367, Cl. 560-026.000.
Knorr-Bremse GmbH: *See—*
Huber, Johann, 4,480,875, Cl. 303-38.000.
Wirth, Xaver, 4,480,722, Cl. 188-59.000.
Knox, Gayle B. Fly guard. 4,480,429, Cl. 54-80.000.
Kobari, Yukio: *See—*
Kashiwagi, Yoshiyuki; Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,481,390, Cl. 200-144.00B.
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, to Toyota Jidosha K.K.; and Nippondenso Co., Ltd. Idling speed control device of an internal combustion engine. 4,480,614, Cl. 123-339.000.
Kobayashi, Haruhiko: *See—*
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, 4,480,618, Cl. 123-438.000.
Kobayashi, Hiroto; and Kobayashi, Takeshi, to Walbro Far East, Inc. Rotary throttle valve carburetor. 4,481,152, Cl. 261-35.000.
Kobayashi, Hiroto; and Kobayashi, Takeshi, to Walbro Far East, Inc. Rotary throttle valve carburetor. 4,481,153, Cl. 261-44.00A.
Kobayashi, Hisao: *See—*
Kono, Hiroya; Hasegawa, Jun; Deguchi, Hiroyuki; and Kobayashi, Hisao, 4,480,961, Cl. 417-15.000.
Kobayashi, Saburo; and Yoshida, Takao, to Casio Computer Co., Ltd. Electronic dictionary. 4,481,607, Cl. 364-900.000.
Kobayashi, Takashi: *See—*
Yano, Kiyoshi; Taneda, Yukinori; and Kobayashi, Takashi, 4,480,799, Cl. 242-25.00R.
Kobayashi, Takeshi: *See—*
Kobayashi, Hiroto; and Kobayashi, Takeshi, 4,481,152, Cl. 261-35.000.
Kobayashi, Hiroto; and Kobayashi, Takeshi, 4,481,153, Cl. 261-44.00A.
Kobayashi, Toshio: *See—*
Takano, Toshio; and Kobayashi, Toshio, 4,480,505, Cl. 74-869.000.
Kobayashi, Yoshiaki; and Mori, Atsushi, to Sanshin Kogyo Kabushiki Kaisha. Lubricating system for two-circle internal combustion engine. 4,480,602, Cl. 123-73.0AD.
Kobler, Ulrich; and Wanka, Eberhard, to Siemens Aktiengesellschaft. Polarized electromagnetic relay. 4,481,493, Cl. 335-179.000.
Kocks Technik GmbH & Co.: *See—*
Moltner, Hermann, 4,480,457, Cl. 72-208.000.
Zacharias, Theodor; Gerhards, Hans D.; and Staat, Karlhans, 4,480,515, Cl. 83-81.000.
Kockumation AB: *See—*
Blakeslee, Charles E.; and Alsenfelt, Ingemar, 4,480,658, Cl. 137-315.000.
Koepke, Jeffery W.: *See—*
Young, Dean A.; and Koepke, Jeffery W., 4,481,102, Cl. 208-120.000.
Koffler, Thomas, to Innovative Molding Technology Inc. (Imtech). Two-component scrub brush. 4,480,351, Cl. 15-187.000.
Koga, Shosuke; Koketsu, Mitsuru; Ohta, Yoshihiro; and Satomi, Seigo, to NGK Insulators, Ltd. Thermal shock resistant porous sound absorbing body. 4,481,124, Cl. 252-62.000.
Kogler, Horst; and Drust, Peter, to Gebr. Hofmann GmbH & Co. Kg, Maschinenfabrik. Method and apparatus for marking the unbalances onto a rotating body, especially an automobile wheel. 4,480,471, Cl. 73-462.000.
Kohashi, Tadao: *See—*
Esaki, Hiroshi; and Kohashi, Tadao, 4,481,520, Cl. 346-140.00R.
Kohl, Vance L.: *See—*
Schulze-Berge, Carl J.; and Kohl, Vance L., 4,480,441, Cl. 62-138.000.
Koketsu, Mitsuru: *See—*
Koga, Shosuke; Koketsu, Mitsuru; Ohta, Yoshihiro; and Satomi, Seigo, 4,481,124, Cl. 252-62.000.
Kolb, Gunter: *See—*
Sackmann, Gunter; Kolb, Gunter; Probst, Joachim; Muller, Friedhelm; and Baumgen, Heinz, 4,481,319, Cl. 524-213.000.
Koller, Manfred; Itzinger, Hermann; Handke, Gunther; Gottwalt, Karl; and Eusemann, Robert, to Fichtel & Sachs AG. Shock absorber unit for vehicles. 4,480,730, Cl. 188-315.000.
Kolodzey, Wolfgang: *See—*
Lusch, Jurgen; Lieder, Bernhard; Heinen, Heinrich; and Kolodzey, Wolfgang, 4,481,015, Cl. 48-202.000.
Kolpe, Vasant V.; Sherman, Dudley M.; Hendrickson, William A.; and Chou, Hsin-hsin, to Minnesota Mining and Manufacturing Company. Process for making primed polymer surfaces and charge transfer media having conductivity sites thereon. 4,481,234, Cl. 427-71.000.
Komatsu, Shiro, to Fujikin International, Inc. Vehicle for displaying goods. 4,480,866, Cl. 296-21.000.
Komiya, Hidetsugu, to Fanuc Ltd. Method and apparatus for adjusting installation position of switch members in numerical control system. 4,481,588, Cl. 364-474.000.
Komori Printing Machinery Co., Inc.: *See—*
Uno, Chiyomatsu; and Kuroda, Tamio, 4,480,546, Cl. 101-248.000.
Kondo, Mitsuo; Minamino, Hiromi; Otani, Yasuhisa; Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, to Kanebo, Ltd.; and Maruzen Kasei Co., Ltd. Clear liquid skin cosmetic compositions. 4,481,187, Cl. 424-63.000.
Kondo, Shigeru: *See—*
Nishino, Hisao; and Kondo, Shigeru, 4,481,431, Cl. 307-300.000.
Kondo, Takashi: *See—*
Kawai, Yukio; Morishita, Michio; Otsuki, Hiromi; and Kondo, Takashi, 4,480,661, Cl. 137-544.000.
Kondo, Yataro: *See—*
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, 4,480,910, Cl. 355-30.000.
Kongoh, Takeshi: *See—*
Makabe, Hachiro; Tanaka, Haruhiko; Orii, Akira; and Kongoh, Takeshi, 4,480,561, Cl. 112-158.00E.
Konig, Heinz-Werner: *See—*
Bergemann, Klaus-Dieter; Deike, Karl-Heinz; Kiel, Bernd-Joachim; and Konig, Heinz-Werner, 4,480,663, Cl. 137-627.500.
Konig, Werner, to Daimler-Benz Aktiengesellschaft. Guide control rod for wheel suspensions of motor vehicles. 4,480,498, Cl. 74-579.00R.
Konishiroku Photo Industry Co., Ltd.: *See—*
Itaya, Masahiko; Haneda, Satoshi; and Tomono, Makoto, 4,480,911, Cl. 355-3.0DD.
Yamada, Yoshitaka; Iijima, Toshifumi; Yagi, Toshihiko; Haga, Yoshihiro; Kumashiro, Kenji; and Menjo, Hiroshi, 4,481,288, Cl. 430-506.000.
Konno, Tatsuo: *See—*
Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, 4,480,903, Cl. 354-465.000.
Kono, Hiroya; Hasegawa, Jun; Deguchi, Hiroyuki; and Kobayashi, Hisao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate type compressor with a malfunction detector. 4,480,961, Cl. 417-15.000.
Kononen, Seppo: *See—*
Vaittinen, Jorma; and Kononen, Seppo, 4,480,667, Cl. 144-373.000.
Koshoji, Yoshihiro; and Sato, Kenji, to Director General, Technical Research and Development Institute, (TRDI) The Defence Agency; and Hitachi Zosen Corporation. Shock-absorbing winch. 4,480,817, Cl. 254-332.000.
Kosmowski, Wojciech B., to BMC Industries, Inc. Workpiece holding and alignment device. 4,480,364, Cl. 29-56.600.
Kosonen, Pentti: *See—*
Teglund, Lars; Kosonen, Pentti; and Oldani, Melchiorre, 4,480,655, Cl. 137-132.000.
Koster, Raymond E. Overcenter locking hose clamp. 4,480,359, Cl. 24-270.000.
Koto, Masaaki, to Toyo Kogyo Co., Ltd. Motor truck body structure. 4,480,868, Cl. 296-190.000.
Kovach, Ronald J.: *See—*
Box, Stephen J. C.; Kovach, Ronald J.; and Desroziers, Andre J., 4,481,630, Cl. 372-38.000.
Kowa Company, Ltd.: *See—*
Niwa, Hideaki, 4,481,666, Cl. 382-53.000.
Kowalski, Krzysztof: *See—*
Wirpsza, Zygmunt; and Kowalski, Krzysztof, 4,481,346, Cl. 528-73.000.
Kowol, Ewald: *See—*
Huschelrath, Gerhard; Kowol, Ewald; and Orthen, Ursula, 4,480,477, Cl. 73-643.000.

Koyama, Linda J.: *See*—
Thomas, Mammen; and Koyama, Linda J., 4,481,070, Cl. 156-643.000.

Kozerski, Richard J., to Dana Corporation. Cylinder head gasket with variable thickness fire ring. 4,480,844, Cl. 277-235.00B.

Kraft, Harald; and Leimanis, Peter, to Feldmuhle Aktiengesellschaft. Cutting tool. 4,480,950, Cl. 407-103.000.

Krambeck, Frederick J.; Nace, Donald M.; and Schipper, Paul H., to Mobil Oil Corporation. Fluidized catalytic cracking process with long residence time steam stripper. 4,481,103, Cl. 208-120.000.

Krambeck, Frederick J .: *See*—
Kennedy, Clinton R.; and Krambeck, Frederick J ., 4,481,100, Cl. 208-11.00R.

Kras Corporation: *See*—
Plummer, Lawrence L.; and Mikle, Kenneth, 4,480,975, Cl. 425-116.000.

Krasselt, Manfred M.: *See*—
Apontoweil, Peter; and Krasselt, Manfred M., 4,481,188, Cl. 424-89.000.

Krauser Kraftfahrzeug-Zubehoer Vertriebs GmbH: *See*—
Krauser, Michael, 4,480,773, Cl. 224-32.00A.

Krauser, Michael, to Krauser Kraftfahrzeug-Zubehoer Vertriebs GmbH. Holding device for motorcycles. 4,480,773, Cl. 224-32.00A.

Kray, William D., to General Electric Company. Purification of chlorosilanes. 4,481,178, Cl. 423-342.000.

Kreij, Sven E., to Saab-Scania Aktiebolag. Sealing device for valves. 4,480,815, Cl. 251-298.000.

Krekeler, Ulrich: *See*—
Wagensonner, Eduard; Krekeler, Ulrich; and Ruf, Wolfgang, 4,481,530, Cl. 358-44.000.

Krembel, Frank, Jr., to Columbia Marking Tools, Inc. Rotary wheel marking head and indexing structure therefor. 4,480,539, Cl. 101-18.000.

Krenitsky, Thomas A.: *See*—
Rideout, Janet L.; and Krenitsky, Thomas A., 4,481,197, Cl. 424-180.000.

Krieger, Raymond L.; Volna, Steven J.; and Able, Edward T., to Sargent Industries, Inc. Mechanical differential-rate counterboring tool. 4,480,700, Cl. 173-145.000.

Kristensen, Henning. Apparatus for delivering heated fluid medium. 4,480,631, Cl. 126-360.00R.

Kronauge, James F.; and Glavan, Kenneth A., to E. R. Squibb & Sons, Inc. Cationic technetium (I) complexes. 4,481,184, Cl. 424-1.100.

Kroning, Armin; Kerscher, Max; and Krummel, Peter, to Siemens Aktiengesellschaft. Inverter with charging regulator having a variable keying ratio. 4,481,460, Cl. 323-266.000.

Kruger, Wolfgang; and Huther, Werner, to Mortoren-und Turbinen-Union. Turbine rotor blade for a turbomachine especially a gas turbine engine. 4,480,956, Cl. 416-97.00A.

Krummel, Peter: *See*—
Kroning, Armin; Kerscher, Max; and Krummel, Peter, 4,481,460, Cl. 323-266.000.

Krupp Stahl AG: *See*—
Raquet, Erwin, 4,481,638, Cl. 373-98.000.

Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Driving device for automobiles. 4,480,499, Cl. 74-695.000.

Kubo, Souichi; and Okano, Yukio, to Minolta Camera Kabushiki Kaisha. Optical filter suitable for portrait photography. 4,480,896, Cl. 350-431.000.

Kubota, Tomio; and Wurster, Herbert K., to Ricoh Systems, Inc. Photoreceptor containing squaric acid methine dyes. 4,481,270, Cl. 430-55.000.

Kucherenko, Sergei V.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Shumikhin, Vladimir S.; Kucherenko, Sergei V.; Zhelnis, Mechialav V.; and Zemlyavichus, Pranas V., 4,480,820, Cl. 266-44.000.

Kuchler, Rainer: *See*—
Herbrich, Horst; Kuchler, Rainer; and Streng, Erich, 4,481,632, Cl. 372-58.000.

Kuhl, Martin, to Rosenthal Technik AG. Process for continuous production of shaped bodies of synthetic resin reinforced with axially parallel fibers. 4,481,056, Cl. 156-180.000.

Kukes, Simon G.; and Banks, Robert L., to Phillips Petroleum Company. Disproportionation process. 4,481,377, Cl. 585-646.000.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; Mallon, Joseph R., Jr.; and Nunn, Timothy A., 4,481,497, Cl. 338-2.000.

Kumada, Masaharu: *See*—
Ezawa, Masayoshi; Misumi, Akira; Suzuki, Kenkichi; and Kumada, Masaharu, 4,481,265, Cl. 429-9.000.

Kumashiro, Kenji: *See*—
Yamada, Yoshitaka; Iijima, Toshifumi; Yagi, Toshihiko; Haga, Yoshihiro; Kumashiro, Kenji; and Menjo, Hiroshi, 4,481,288, Cl. 430-506.000.

Kungla, Rein: *See*—
Chang, Yih-Yi; and Kungla, Rein, 4,480,604, Cl. 123-142.50E.

Kuniyoshi, Shinji: *See*—
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, 4,480,910, Cl. 355-30.000.

Kunzfeld, Wilhelm, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnick. Device for testing the tension of a driving belt during operation. 4,480,487, Cl. 73-862.450.

Kuramochi, Koujiro: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,480,499, Cl. 74-695.000.

Kuramoto, Takashi: *See*—
Kondo, Mitsuo; Minamino, Hiromi; Otani, Yasuhisa; Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, 4,481,187, Cl. 424-63.000.

Kuraoka, Yasuo: *See*—
Kaneta, Hiroshi; Sakao, Nobuo; and Kuraoka, Yasuo, 4,480,682, Cl. 165-14.000.

Kurby, Christopher N., to Motorola Inc. Binary signal modulating circuitry for frequency modulated transmitters. 4,481,489, Cl. 332-19.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Katsumichi; Kanda, Yoichi; Shida, Takafumi; Satake, Keigo; and Shinkawa, Hiroyasu, 4,481,027, Cl. 71-90.000.

Kurihara, Hitoshi; and Wakazawa, Toru, to Canon Denshi Kabushiki Kaisha. Printing type drum. 4,480,935, Cl. 400-145.200.

Kurita, Kunio: *See*—
Asano, Yuichiro; Suzuki, Taira; Yabe, Tadashi; Kurita, Kunio; Ohga, Suehisa; Hirahashi, Akira; and Momose, Atsushi, 4,480,919, Cl. 356-376.000.

Kuroda, Tamio: *See*—
Uno, Chiyomatsu; and Kuroda, Tamio, 4,480,546, Cl. 101-248.000.

Kurosaki, Toshiei: *See*—
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, 4,480,910, Cl. 355-30.000.

Kurt Manufacturing Company, Inc.: *See*—
Hoodbhoy, Samir A., 4,481,569, Cl. 364-183.000.

Kurtz, Anthony D.; Mallon, Joseph R., Jr.; and Nunn, Timothy A., to Kulite Semiconductor Products, Inc. Transducer structures employing ceramic substrates and diaphragms. 4,481,497, Cl. 338-2.000.

Kurtz, Leonard D., to BioResearch Inc. Apparatus and method for relieving excess negativity in a drainage device. 4,481,008, Cl. 604-118.000.

Kussi, Siegfried: *See*—
Hentschel, Karl-Heinz; Dhein, Rolf; Kussi, Siegfried; Winter, Hans; and Vojacek, Herbert, 4,481,123, Cl. 252-52.00R.

Kuzan, Frank R.: *See*—
White, Robert W.; and Kuzan, Frank R., 4,480,378, Cl. 29-596.000.

Kuznicki, Steven M.: *See*—
Coe, Charles G.; and Kuznicki, Steven M., 4,481,018, Cl. 55-68.000.

KV33 Corporation: *See*—
Huffman, Ronald E., 4,481,162, Cl. 264-334.000.

Kyushima, Tatsuo: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,480,499, Cl. 74-695.000.

L. & C. Steinmuller GmbH: *See*—
Dorling, Rolf, 4,481,014, Cl. 48-76.000.

Lab Products, Inc.: *See*—
Sedlacek, Robert S., 4,480,587, Cl. 119-15.000.

Lackey, Walter J.: *See*—
Angelini, Peter; Caputo, Anthony J.; Hutchens, Richard E.; Lackey, Walter J.; and Stinton, David P., 4,481,134, Cl. 252-628.000.

LaFleur, Arthur E.; and LaFleur, Lee, to Custom Packaging Systems, Inc. Bag making method and machine. 4,481,006, Cl. 493-194.000.

LaFleur, Lee: *See*—
LaFleur, Arthur E.; and LaFleur, Lee, 4,481,006, Cl. 493-194.000.

LaFrance Corporation: *See*—
Teti, Joseph A., Jr., 4,480,399, Cl. 40-584.000.

Lagana', Vincenzo: *See*—
di Pietro, Raffaele; Paggini, Alberto; and Lagana', Vincenzo, 4,481,012, Cl. 44-53.000.

Lague, Gerald; Baldur, Roman; Marois, Paul; Brossard, Maurice; Quevillon, Marc; Di Franco, Enrico; and Dugre, Robert, to I.A.F. Production Inc. Chamber for vapor immunization of chickens or the like fowls. 4,480,586, Cl. 119-15.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Goursat, Albert-Gilbert; Hersant, Thierry; and Nicolas, Jacques, 4,480,770, Cl. 222-590.000.

Landa, Benzion, to Savin Corporation. Sheet set separator for electrophotographic copier. 4,480,825, Cl. 271-81.000.

Landini, Melvin L.: *See*—
Haywood, Ronald S.; and Landini, Melvin L., 4,480,786, Cl. 237-78.00R.

Lane, Kerry S., to Levitt-Safety Limited. Miners lamp power pack. 4,481,458, Cl. 320-2.000.

Lane, Michael S.: *See*—
Baranyai, Lawrence; Colton, John R.; Lane, Michael S.; and Sosnowski, Thomas P., 4,481,624, Cl. 370-62.000.

Lanning, Charles T., to Site-Lite, Inc. Gun bore sighting flashlight activated upon breech closure. 4,481,561, Cl. 362-111.000.

Laran, Roy J., to Ethyl Corporation. Synthesis of complex beryllium hydrides. 4,481,182, Cl. 423-644.000.

Laran, Roy J., to Ethyl Corporation. Synthesis of complex beryllium hydrides. 4,481,183, Cl. 423-644.000.

Larsson, Sten, to Siemens Aktiengesellschaft. Patient support apparatus comprising a rotatable support. 4,481,657, Cl. 378-209.000.

Laser Corporation: *See*—
McMahan, William H., 4,481,633, Cl. 372-62.000.

Latham, Winchester E. Flighting section and tooth holder. 4,480,873, Cl. 299-87.000.

Lattery, William F., Jr.; and Crowther, Gary J. Powdered food product mixing device. 4,480,926, Cl. 366-251.000.
Latvietis, Yan Y.: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.
Lau, Harlan: *See*—
Roberts, Allen W.; McFarland, Harold L., Jr.; and Lau, Harlan, 4,481,625, Cl. 370-85.000.
Laucis, Peter K.; and Terry, Robert, to Nordson Corporation. Tamper-evident container and method for making the same. 4,480,749, Cl. 206-459.000.
Lauterbach, John. Tiller tender. 4,480,572, Cl. 114-162.000.
Lavins, Paul N.; and Bogan, Thomas R. Multi-directional oscillating breakoff mechanism for separating billets. 4,481,398, Cl. 219-10.690.
LeBerre, Serge: *See*—
Hareng, Michel; Hehlen, Robert; LeBerre, Serge; and Leclerc, Pierre, 4,481,510, Cl. 340-784.000.
Lechner, Hubert: *See*—
Meisser, Claudio; Lechner, Hubert; and Steinle, Benedikt, 4,480,486, Cl. 73-861.280.
Leclerc, Pierre: *See*—
Hareng, Michel; Hehlen, Robert; LeBerre, Serge; and Leclerc, Pierre, 4,481,510, Cl. 340-784.000.
Le Covec, Jean, to Hamon-Sobelco, S.A. Atmospheric/liquid cooler construction. 4,481,156, Cl. 261-111.000.
Lee, Kien-yin: *See*—
Cady, Howard H.; and Lee, Kien-yin, 4,481,048, Cl. 149-47.000.
Lee, Lawrence C.; Tyagi, Mukul K.; Furnas, Michael W.; and Traylor, Francis T., to TRW Inc. Liquid-gas separator apparatus. 4,481,020, Cl. 55-203.000.
Lee, Nancy M.: *See*—
Wei, Edward T.; Lee, Nancy M.; and Chang, Jaw-Kang, 4,481,191, Cl. 424-177.000.
Lee, Phillip L.: *See*—
Raske, Theodore F.; and Lee, Phillip L., 4,480,705, Cl. 177-50.000.
Lee, Pok F.: *See*—
Chow, Sherman M.; and Lee, Pok F., 4,481,640, Cl. 375-1.000.
Legerius, Bengt E.; and Siebert, Hans W., to Telefonaktiebolaget L M Ericsson. Prefabricated lubricant unit. 4,480,717, Cl. 184-14.000.
Lehman, F. Allen; Sieffel, William M.; and Ray, Malcolm G., to Kerr-McGee Corporation. Production monitoring system. 4,481,503, Cl. 340-518.000.
Leimanis, Peter: *See*—
Kraft, Harald; and Leimanis, Peter, 4,480,950, Cl. 407-103.000.
Leiper, Fred B., to Hardware Designers, Inc. Clearance adjustable drawer slide assembly. 4,480,878, Cl. 308-3.800.
Leistner, Hermann: *See*—
Schiessl, Hans; and Leistner, Hermann, 4,481,595, Cl. 364-562.000.
Leland Stanford Junior University, The Board of Trustees of the: *See*—
Tatchyn, Roman O., 4,481,653, Cl. 378-85.000.
Leliaert, Raymond M.: *See*—
Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., 4,480,413, Cl. 51-435.000.
Lenkeit Industries, Inc.: *See*—
Alzmann, Donald R.; Angelo, Michael; and Waldner, Paul R., 4,481,533, Cl. 358-101.000.
Lennon, Dennis R., to International Coal Refining Company. Pneumatic conveying of pulverized solvent refined coal. 4,480,560, Cl. 110-342.000.
Leonard Automatics, Inc.: *See*—
Frushtick, Leonard, 4,480,398, Cl. 38-42.000.
Leroy, Louis, to Etablissements Ruby. Machine for continuously cutting a strip for forming sections with rounded edges having opposite curvatures. 4,480,516, Cl. 83-98.000.
Les Cables de Lyon: *See*—
Guazzo, Lucien; and Vives, Jean-Patrick, 4,481,381, Cl. 174-135.000.
Lesk, Israel A., to Motorola, Inc. Protected photovoltaic module. 4,481,378, Cl. 136-244.000.
LeStrange, Raymond J.: *See*—
Beutel, Jacob; and LeStrange, Raymond J., 4,481,359, Cl. 546-114.000.
Leuchter, Jurgen: *See*—
Osegowitsch, Viktor; and Leuchter, Jurgen, 4,480,901, Cl. 354-320.000.
Leuenberger, Hermann, to Losinger AG. Method and apparatus for laying underwater coverings. 4,480,943, Cl. 405-172.000.
Leupold, Ernst I.; Schmidt, Hans-Joachim; and Popp, Knut, to Hoechst Aktiengesellschaft. Process for the preparation of an ethyl ester. 4,481,146, Cl. 260-410.90R.
Leupold, Ernst I.: *See*—
Wunder, Friedrich; Leupold, Ernst I.; and Litterer, Heinz, 4,481,376, Cl. 585-640.000.
Levasseur, Joseph L.: *See*—
Jamgochian, Herbert H.; and Levasseur, Joseph L., 4,480,737, Cl. 194-4.00C.
Leveque, Jean-Luc; and Gras, Gilbert, to L'Oreal. Apparatus to register the quantity of sebum secreted by a skin. 4,480,921, Cl. 356-434.000.
Lever Brothers Company: *See*—
Behrens, Rainer; Peissl, Dieter; Schondelmayer, Jurgen; and Brach, Ulrich, 4,480,759, Cl. 215-220.000.
Oakes, John, 4,481,129, Cl. 252-186.410.
Levine, Peter A.: *See*—
Jastrzebski, Lubomir L.; and Levine, Peter A., 4,481,522, Cl. 357-24.000.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Triazinylsulfonyl-ureas and isoureas. 4,481,029, Cl. 71-93.000.
Levitt-Safety Limited: *See*—
Lane, Kerry S., 4,481,458, Cl. 320-2.000.
Levshina, Kira V., deceased: *See*—
Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia. F., administrator, 4,481,201, Cl. 424-250.000.
Lewarchik, Ronald J.: *See*—
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,481,093, Cl. 204-159.190.
Lewtas, Kenneth: *See*—
Tack, Robert D.; Lewtas, Kenneth; and Davies, Brian W., 4,481,013, Cl. 44-62.000.
Leyrer, Reinhold J.: *See*—
Eckell, Albrecht; Eilingsfeld, Heinz; Elzer, Albert; Feichtmayr, Franz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,481,272, Cl. 430-58.000.
LGZ Landis & Gyr Zug AG: *See*—
Meisser, Claudio; Lechner, Hubert; and Steinle, Benedikt, 4,480,486, Cl. 73-861.280.
Li, Yuan-Lu; and Crane, Leslie J., to Northern Telecom Limited. Optical transmitting and receiving apparatus. 4,481,677, Cl. 455-617.000.
Licentia Patent-Verwaltungs-GmbH: *See*—
Schmack, Hans-Jurgen; and Rauth, Erich, 4,481,621, Cl. 370-3.000.
Lichte, Norbert: *See*—
Buck, Robert; and Lichte, Norbert, 4,481,559, Cl. 361-395.000.
Lieder, Bernhard: *See*—
Lusch, Jurgen; Lieder, Bernhard; Heinen, Heinrich; and Kolodzey, Wolfgang, 4,481,015, Cl. 48-202.000.
Liepinsh, Edvards E.: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.
Ligorati, Ferdinando: *See*—
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Lill, Harold K.: *See*—
Stokes, Paul W.; Doody, Brian C.; and Lill, Harold K., 4,481,407, Cl. 219-457.000.
Lin, Ching-Hsiung. Screw driver kit. 4,480,668, Cl. 145-63.000.
Lin, Henry C.; and Cotter, Byron R., to Occidental Chemical Corporation. Method for the preparation of benzenamines. 4,481,370, Cl. 564-394.000.
Lindemann, Paul E.: *See*—
Anderson, John K.; and Lindemann, Paul E., 4,481,165, Cl. 376-272.000.
Linger, Claude J. A.; and Locicero, Gisele C., to International Business Machines Corporation. Process for inspecting objects showing patterns with dimensional tolerances and reject criteria varying with the locations of said patterns and apparatus and circuits for carrying out said process. 4,481,664, Cl. 382-8.000.
Liquid Level Lectronics, Inc.: *See*—
Johnson, J. Wallace, 4,481,389, Cl. 200-84.00C.
List, Hans: *See*—
Fredericks, George E.; and Preschern, Horst, 4,481,465, Cl. 324-60.0CD.
Littauer, Ernest L.; and Momyer, William R. Reactive metal battery having continuous supply of cathode reactant. 4,481,266, Cl. 429-12.000.
Litterer, Heinz: *See*—
Wunder, Friedrich; Leupold, Ernst I.; and Litterer, Heinz, 4,481,376, Cl. 585-640.000.
Litton Industrial Products, Inc.: *See*—
Shank, William E.; and Bercaw, Kenneth K., 4,480,412, Cl. 51-165.00R.
Litton Systems, Inc.: *See*—
Phillips, Robert M., 4,481,444, Cl. 315-3.600.
Liu, Ping Y. Polycarbonate resin mixture. 4,481,331, Cl. 525-92.000.
Ljung, Egil K.: *See*—
Bengtsson, Nils K.; and Ljung, Egil K., 4,480,727, Cl. 188-165.000.
Locher, Hermann, to Giroflex Entwicklungs AG. Ball locking mechanism. 4,480,497, Cl. 74-531.000.
Locicero, Gisele C.: *See*—
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Lock, William E.; and Peters, Donald C., to Corning Glass Works. Printing apparatus and method. 4,480,540, Cl. 101-36.000.
Lockwood, William T.: *See*—
Clement, Ralph C.; Parmenter, Charles W.; and Lockwood, William T., 4,481,391, Cl. 200-163.000.
Lodrini, Albert C. Finger ring and insert therefor. 4,480,447, Cl. 63-15.600.
Loevinger, Richard P. Heated railroad tank car. 4,480,370, Cl. 29-401.100.
LOF Plastics Inc.: *See*—
Berkemeier, Donald E., 4,480,675, Cl. 160-121.00C.

LoFiego, Louis, to Whittaker Corporation. Point-detonating variable time-delayed fuze. 4,480,551, Cl. 102-245.000.

Loforese, Leonard T., to Electrolux Corporation. Field coil terminal connector for stator assemblies. 4,481,435, Cl. 310-71.000.

Logan, Ralph A.: *See*—
Henry, Charles H.; and Logan, Ralph A., 4,481,631, Cl. 372-45.000.

Loge, David B.; Cole, William A.; and Migdal, Kevin J., to GoodMark Foods, Inc. Interlocking modular display rack system, component units therefor, and methods. 4,480,745, Cl. 206-44.00R.

Loizeau, Pierre, to Valeo. Torsional dampers. 4,480,736, Cl. 192-106.100.

Long, Edward M.; and Wickersham, Ronald J. Method and apparatus for operating a loudspeaker below resonant frequency. 4,481,662, Cl. 381-98.000.

Lonnemo, Kurt R., to Vickers, Incorporated. Power transmission. 4,480,527, Cl. 91-436.000.

Lonza Ltd.: *See*—
Dinkel, Rolf; Roedel, Hilmar; and Grayson, James I., 4,481,361, Cl. 546-251.000.

Lopez, Keith. Attachable/detachable railing device. 4,480,819, Cl. 256-1.000.

L'Oreal: *See*—
Leveque, Jean-Luc; and Gras, Gilbert, 4,480,921, Cl. 356-434.000.

Losinger AG: *See*—
Leuenberger, Hermann, 4,480,943, Cl. 405-172.000.

Lowe, Byron L.: *See*—
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., 4,480,982, Cl. 425-385.000.

Lowe, Greg E.; and Lowe, Michael R. Crampon construction and method of attachment. 4,480,396, Cl. 36-7.600.

Lowe, Michael R.: *See*—
Lowe, Greg E.; and Lowe, Michael R., 4,480,396, Cl. 36-7.600.

Loweg, Heribert: *See*—
Collet, Erwin; and Loweg, Heribert, 4,480,381, Cl. 29-746.000.

Lowell, Philip S.; and Phillips, James L., to Environmental Elements Corp. Process for removal of sulfur oxides from waste gases. 4,481,172, Cl. 423-242.000.

Lowrance Electronics, Inc.: *See*—
Healey, Robert W., 4,480,809, Cl. 248-185.000.

Luc, Penelope J., to Luc Technologies Limited. Conductive connections. 4,480,779, Cl. 228-112.000.

Luc Technologies Limited: *See*—
Luc, Penelope J., 4,480,779, Cl. 228-112.000.

Lucas Industries Public Limited Company: *See*—
Thomas, Gerald S., 4,480,623, Cl. 123-514.000.

Lucier, Peter F.: *See*—
Heimer, Robbin; Shepard, Thomas C.; and Lucier, Peter F., 4,480,410, Cl. 51-5.00D.

Lueptow, Richard M., to Haemonetics Corporation. Apparatus for collecting, storing and dispensing frozen blood plasma. 4,480,751, Cl. 206-628.000.

Lukas, Michael P.: *See*—
Kaya, Azmi; and Lukas, Michael P., 4,481,567, Cl. 364-157.000.

Lukawich, Joseph J.; and Adams, Kenneth D., to Singer Company, The. Mending attachment for a sewing machine. 4,480,566, Cl. 112-321.000.

Luke, John A., to British-American Tobacco Company Limited. Manufacture of cigarettes. 4,480,644, Cl. 131-68.000.

Lundberg, Robert D.; and Thaler, Warren A., to Exxon Research & Engineering Co. Sulfonated polymer and compositions thereof. 4,481,318, Cl. 524-211.000.

Luossavaara-Kiirunavaara AB: *See*—
Manstrom, Hilding, 4,480,954, Cl. 414-383.000.

Lurssen, Klaus: *See*—
Forster, Heinz; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, 4,481,365, Cl. 556-422.000.

Lusch, Jurgen; Lieder, Bernhard; Heinen, Heinrich; and Kolodzey, Wolfgang, to Ruhrchemie Aktiengesellschaft. Coal-water suspensions, a method for their production, and their use. 4,481,015, Cl. 48-202.000.

Luthi, Oscar, to Ingersoll-Rand Company. Conduction dryer for flaked or fluffed material. 4,480,392, Cl. 34-10.000.

Lutz, James F.: *See*—
Marguliefsky, Allen L.; and Lutz, James F., 4,480,446, Cl. 62-474.000.

M.A.N. Roland Druckmaschinen AG: *See*—
Rebel, Herbert; and Herold, Manfred, 4,480,548, Cl. 101-426.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,480,544, Cl. 101-177.000.
Hechler, Hatto, 4,480,543, Cl. 101-152.000.

M. H. Detrick Company: *See*—
Bly, Lloyd G., 4,481,024, Cl. 65-337.000.

M and M Technics AG: *See*—
Bramer, Albert J., 4,480,455, Cl. 72-95.000.

Mabry, C. Thomas, to Xerox Corporation. Memory disc drive. 4,481,617, Cl. 369-77.200.

MacFarlane, James L.: *See*—
Soubry, Garry V.; and MacFarlane, James L., 4,480,716, Cl. 182-233.000.

Machonis, John, Jr.: *See*—
Shida, Mitsuzo; Zeitlin, Robert; Machonis, John, Jr.; and Adur, Ashok M., 4,481,262, Cl. 428-441.000.

Machi, Jon A.; and Clark, Brian C., to Owatonna Manufacturing Company, Inc. Brake system. 4,480,708, Cl. 180-6.480.

Macht, Jon A.; and Jines, Mike D., to Owatonna Manufacturing Company, Inc. Operator restraint/control lockout system. 4,480,713, Cl. 180-268.000.

Mackowiak, Leonard S.; Ellison, Frank E.; Fidler, Jay W.; Tucker, N. George; and Varma, Gangdhar M. N., to Hercules Chemical Company, Inc. Non-corrosive creosote and soot removing composition. 4,481,010, Cl. 44-5.000.

Maclin, Harvey M., to General Electric Company. Combustion chamber construction. 4,480,436, Cl. 60-39.320.

Madon, James J., to AT&T Bell Laboratories. Communication system recording arrangement. 4,481,383, Cl. 179-7.10R.

Maeda, Masaya, to Canon Kabushiki Kaisha. Magnetic recording and reproducing apparatus. 4,481,551, Cl. 360-85.000.

Maerz Ofenbau AG: *See*—
Fussl, Erwin, 4,480,991, Cl. 432-14.000.

Maguire, Edward A.: *See*—
Hartnett, Thomas M.; Gentilman, Richard L.; and Maguire, Edward A., 4,481,300, Cl. 501-98.000.

Mahyera, Anil; Sweet, Robert M.; and Brest Van Kempen, Carel J. H. Self-aligning stuffing box. 4,480,842, Cl. 277-22.000.

Makabe, Hachiro; Tanaka, Haruhiko; Orii, Akira; and Kongoh, Takeshi, to Janome Sewing Machine Co., Ltd. Electronic sewing machine with trouble diagnosing function. 4,480,561, Cl. 112-158.00E.

Maki, Masami: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yokote, Sachio; Sekiguchi, Katsumi; Sasagawa, Katsuyoshi; and Imai, Masao, 4,481,131, Cl. 252-511.000.

Malick, Franklin S. Cooking appliance. 4,481,405, Cl. 219-405.000.

Mallon, Joseph R., Jr.: *See*—
Kurtz, Anthony D.; Mallon, Joseph R., Jr.; and Nunn, Timothy A., 4,481,497, Cl. 338-2.000.

Mallon, Richard G., to United States of America, Energy. Staged fluidized bed. 4,481,080, Cl. 201-31.000.

Mancuso, James F.: *See*—
Tsao, Mike C.; and Mancuso, James F., 4,480,475, Cl. 73-610.000.

Mandai, Tomomasa; Ohta, Hiromi; Yamazaki, Tadashi; and Urakawa, Yoshihisa, to Matsushita Electric Industrial Co., Ltd. Combustion apparatus for liquid fuels. 4,480,987, Cl. 431-304.000.

Mango, Phillip A.: *See*—
Cook, Gerald R.; and Mango, Phillip A., 4,481,250, Cl. 428-290.000.

Manhart, Michael. Snow gun. 4,480,788, Cl. 239-14.000.

Manitowoc Company, Inc., The: *See*—
Schulze-Berge, Carl J.; and Kohl, Vance L., 4,480,441, Cl. 62-138.000.

Mann, James A., Jr., to McDonnell Douglas Corporation. Chain drive system. 4,481,005, Cl. 474-139.000.

Mancury, Philippe; Binet, Jean; and DeFosse, Gerard, to Synthelabo. 1-Phenethyl-alpha-phenyl-piperidine-3-propanenitriles and their pharmaceutical uses. 4,481,207, Cl. 424-267.000.

Mansfield, Kevin T., to Ciba-Geigy Corporation. Photo-initiated epoxidation of allyl chloride. 4,481,092, Cl. 204-158.00R.

Manstrom, Hilding, to Luossavaara-Kiirunavaara AB. Bottom dump arrangement. 4,480,954, Cl. 414-383.000.

Maquet, Nestor: *See*—
Georlette, Pierre; and Maquet, Nestor, 4,481,158, Cl. 264-22.000.

Marchetti, Richard J.: *See*—
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Marcinczyk, Henry J.; and Gurcew, Ronald J., to Webster Spring Co. Inc. Innerspring assembly for furniture seats and backs. 4,480,823, Cl. 267-91.000.

Marechal, Jean-Pierre; and Maschmeyer, Richard O., to Corning Glass Works. Process to mold precision glass articles. 4,481,023, Cl. 65-64.000.

Mares, Rafael B.: *See*—
Rodriguez, Federico B.; and Mares, Rafael B., 4,481,025, Cl. 65-348.000.

Margerum, Donald L., to Raytheon Company. Radio frequency signal direction finding apparatus. 4,481,519, Cl. 343-434.000.

Marguleſsky, Allen L.; and Lutz, James F. Method and apparatus for rehabilitating refrigerant. 4,480,446, Cl. 62-474.000.

Marinelli, Ralph. Engine lubricating oil level regulator and replenish oil warning system. 4,480,718, Cl. 184-103.00R.

Marks, Anthony L.: *See*—
Huntzinger, Gerald O.; Butler, Raymond O., Jr.; Hetzler, Lewis R.; Delaplane, John; and Marks, Anthony L., 4,481,585, Cl. 364-424.000.

Markus, Michael V.; and Barnett, George H., to ICI Australia Limited. Polymerization process. 4,481,306, Cl. 521-31.000.

Marlin, Robert V.: *See*—
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Marmonier, Andre : *See*—
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Marois, Paul: *See*—
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Marsden, Peter D.: *See*—
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Marshall, Barry R.; and Knight, Paul A., to Ambic Equipment Limited. Vacuum line control valves. 4,480,657, Cl. 137-103.000.
Marshall, Grayson: *See*—
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Marshall, Kenneth D.; and Berzins, Michael A., to B. F. Goodrich Company, The. Antivibration tractor tire. 4,480,672, Cl. 152-209.00B.
Marshall, Sydney D. Idle speed increasing apparatus. 4,480,496, Cl. 74-513.000.
Marten, Manfred; and Becker, Wilhelm, to Hoechst Aktiengesellschaft. Hardener for epoxy resins and process for hardening epoxy resins. 4,481,349, Cl. 528-120.000.
Martin, Donald A. Double-grip clip. 4,480,356, Cl. 24-67.900.
Martin, Douglas S., to Universal Dispensing Systems, Inc. Hand-operated pump. 4,480,768, Cl. 222-341.000.
Martin, Eugene G.; Martin, Harold C.; and Risser, Dale M., to Food-Craft Equipment Co., Inc. Leg splitting machine. 4,480,353, Cl. 17-11.000.
Martin, Harold C.: *See*—
Martin, Eugene G.; Martin, Harold C.; and Risser, Dale M., 4,480,353, Cl. 17-11.000.
Martin Industries, Inc.: *See*—
Wilhoite, Murray O., 4,480,630, Cl. 126-287.000.
Martin, John F.: *See*—
Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Martin, John F., 4,480,581, Cl. 118-50.000.
Martin Marietta Corporation: *See*—
Buchta, William M.; and Nagle, Dennis C., 4,481,052, Cl. 156-155.000.
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Martin, Richard J.; Bondurant, David W.; and Nelson, Leslie W., to Sperry Corporation. Distributed data transfer control for parallel processor architectures. 4,481,580, Cl. 364-200.000.
Martin-Smith, Michael: *See*—
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Marumiya Shoko Co., Ltd.: *See*—
Miyamoto, Eiji, 4,480,517, Cl. 83-210.000.
Maruyama, Keizo: *See*—
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Maruyama, Kensaku: *See*—
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Marx, Matthias: *See*—
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Maschinenbau Oppenweiler Binder GmbH & Co.: *See*—
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Maschinenfabrik Andritz Actiengesellschaft: *See*—
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Maschmeyer, Richard O.: *See*—
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Massachusetts General Hospital Corporation, The: *See*—
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Massachusetts Institute of Technology: *See*—
Grant, Nicholas J.; and Robinson, Ramon K., 4,481,034, Cl. 75-236.000.
Warde, Cardinal; and Shapiro, Jeffrey H., 4,481,531, Cl. 358-60.000.
Masters, William E. Kayak with adjustable rocker. 4,480,579, Cl. 114-347.000.
Masuda, Yugoro; Nonaka, Toyokazu; and Kawase, Shigeru, to Kanebo, Ltd. Wadding materials. 4,481,256, Cl. 428-362.000.
Masurat, Heinz-Werner: *See*—
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Matarese, Alfred P.: *See*—
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Matey, James R., to RCA Corporation. Scanning capacitance microscope. 4,481,616, Cl. 369-58.000.
Mathijssen, Petrus J., to U.S. Philips Corporation. Short-arc discharge lamp. 4,481,443, Cl. 313-636.000.
Matsubayashi, Kazuyuki; and Tateda, Koichi, to Sharp Kabushiki Kaisha. Combination microwave and convection oven. 4,481,396, Cl. 219-10.55B.
Matsuda, Minoru: *See*—
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Matsuda, Shohei: *See*—
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Matsufuji, Akihiro; Umemura, Shizuo; Kasuga, Akira; Miyatuka, Hajime; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Process for preparing ferromagnetic metal powder and a magnetic recording medium including the powder. 4,481,253, Cl. 428-323.000.
Matsui, Kazuma: *See*—
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Matsushiro, Yukimitsu, to Kabushiki Kaisha Matsushiro. Radio-controlled car. 4,480,401, Cl. 446-456.000.
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Mandai, Tomomasa; Ohta, Hiromi; Yamazaki, Tadashi; and Urakawa, Yoshihisa, 4,480,987, Cl. 431-304.000.
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Matsuura, Masaaki: *See*—
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Matthews, Terrence H., to Mitel Corporation. Voice recognizing telephone call denial system. 4,481,384, Cl. 179-18.0DA.
Mattson, Clyde E., to Kearney & Trecker Corporation. Workpiece storage and shuttle apparatus. 4,480,738, Cl. 198-339.000.
Matzold, Uwe; and Heiss, Dieter, to Robert Bosch GmbH. Remote control system, particularly for remote radio transmitter control. 4,481,671, Cl. 455-92.000.
Mauratelli, Luigi. Annealing furnace system. 4,480,822, Cl. 266-256.000.
Maurice, Jean; Travers, Roger; and Camus, Jean-Paul, to CEM Compagnie Electro Mecanique. Apparatus for the magnetic induction heating of flat, rectangular metal products traveling in their longitudinal direction. 4,481,397, Cl. 219-10.61R.
Maxwell, Gordon W., to Courtaulds Limited. Process and machine for fabric treatment. 4,480,362, Cl. 26-28.000.
May, James R.; and Black, Billy E., to Smith International, Inc. Reamer. 4,480,704, Cl. 175-228.000.
McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., to International Business Machines Corporation. File processing method using expanding display windows for selected records and text fields. 4,481,603, Cl. 364-900.000.
McCaughan, Daniel V.: *See*—
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McCauley, Lewis D.; and Taylor, John H., to McGard, Inc. Bolt-lock structure. 4,480,513, Cl. 81-436.000.
McConnell, Richard L.; Joyner, Frederick B.; and Trotter, Jimmy R., to Eastman Kodak Company. Branched polyester waxes. 4,481,351, Cl. 528-272.000.
McConnell, Richard L.; Trotter, Jimmy R.; and Joyner, Frederick B., to Eastman Kodak Company. Polyester waxes based on mixed aliphatic dibasic acids. 4,481,352, Cl. 528-302.000.
McConway & Torley Corporation: *See*—
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McDaniel, Max P.; and Johnson, Marvin M., to Phillips Petroleum Company. Chromium on mixed metal phosphate base with organoboron cocatalyst. 4,481,302, Cl. 502-150.000.
McDonnell Douglas Corporation: *See*—
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McFarland, Archie R.; Middleton, Jack C.; and dos Santos, Claudio, to Beehive Machinery, Inc. Apparatus for extruding composite food products. 4,480,980, Cl. 425-131.100.
McFarland, Harold L., Jr.: *See*—
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McGard, Inc.: *See*—
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McGlew, John J. Connector device. 4,480,890, Cl. 339-113.00R.
McGowan, Michael J.; Slavik, William H.; and Cash, Carson D., III, to Nuvatec, Inc. Material forming machine controller. 4,481,589, Cl. 364-474.000.
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McIntosh, John D.: *See*—
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McIntyre, James A.; and Phillips, Robert F., to Dow Chemical Company, The. Electrode material. 4,481,303, Cl. 502-159.000.
McMahan, William H., to Laser Corporation. Wet-jacket argon-ion laser. 4,481,633, Cl. 372-62.000.
McMillan, John M.: *See*—
Andrews, Errol F.; Peterson, Edward A.; Casbolt, Jeffrey N.; Holt, Kevin E.; McMillan, John M.; and Whiting, Robert E., 4,480,955, Cl. 414-723.000.
McNab, Ian R.: *See*—
Young, Frederick J.; Hughes, William F.; Deis, Daniel W.; and McNab, Ian R., 4,480,523, Cl. 89-8.000.
McShane, James L., to Westinghouse Electric Corp. Acousto-optical ultrasonic flowmeter. 4,480,483, Cl. 73-861.050.

McStravick, David M.; and Chenoweth, David V., to Baker Oil Tools, Inc. Method of making insulated tubular conduit. 4,480,371, Cl. 29-455.00R.
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., to Raychem Corporation. PTC Circuit protection device. 4,481,498, Cl. 338-20.000.
Mead Corporation, The: *See*—
Wood, Prentice J., 4,480,746, Cl. 206-141.000.
Medea Research s.r.l.: *See*—
Bruno, Graziella, 4,481,212, Cl. 424-275.000.
Medical Research Associates, Ltd. #2: *See*—
Sterling, Robert E., 4,481,323, Cl. 524-269.000.
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Meheust, Yves: *See*—
Kerr, George; and Meheust, Yves, 4,481,283, Cl. 430-319.000.
Mehl, Byron R.; Olson, Raymond N.; and Glennon, Timothy F., to Sundstrand Corporation. Combined starting/generating system and method. 4,481,459, Cl. 322-10.000.
Mehta, Pradip S., to USM Corporation. Rotary processors and seals. 4,480,923, Cl. 366-99.000.
Meier, Ernst, to Stopinc AG. Rotary nozzle system for metallurgical vessels. 4,480,771, Cl. 222-598.000.
Meiji, Anahara: *See*—
Hiroshi, Niimi; Meiji, Anahara; and Shigeru, Muramatsu, 4,480,434, Cl. 57-333.000.
Meine, William H.; and Dischert, Robert A., to RCA Corporation. Error correction arrangement for imagers. 4,481,539, Cl. 358-213.000.
Meisser, Claudio; Lechner, Hubert; and Steinle, Benedikt, to LGZ Landis & Gyr Zug AG. Apparatus for measuring liquid flow. 4,480,486, Cl. 73-861.280.
Meives, Otis E.; Verhyen, Larry L., deceased (by Verhyen, Kathleen L., special administrator); and Hickmann, Jerome L., to Pemco, Inc. Apparatus for packaging stacks of sheet material. 4,480,422, Cl. 53-207.000.
Melisz, John M.; and Jellinek, Frank H., to Sybron Corporation. Microscope slide with raised marking surface. 4,481,246, Cl. 428-210.000.
Mendenhall, Robert L. Recycling apparatus for particulate asphaltic concrete. 4,480,922, Cl. 366-25.000.
Mendenhall, Robert L. Method for recycling asphaltic concrete. 4,481,039, Cl. 106-281.00R.
Menjo, Hiroshi: *See*—
Yamada, Yoshitaka; Iijima, Toshifumi; Yagi, Toshihiko; Haga, Yoshihiro; Kumashiro, Kenji; and Menjo, Hiroshi, 4,481,288, Cl. 430-506.000.
Merck & Co., Inc.: *See*—
Johnston, David B. R., 4,481,202, Cl. 424-250.000.
Merritt, Lauren V.: *See*—
Miller, Armin; and Merritt, Lauren V., 4,481,550, Cl. 360-77.000.
Merten, Rudolf: *See*—
Hocker, Jurgen; Merten, Rudolf; and Willenberg, Bernd, 4,481,312, Cl. 524-40.000.
Messer Griesheim GmbH: *See*—
Herbrich, Horst; Kuchler, Rainer; and Streng, Erich, 4,481,632, Cl. 372-58.000.
Metal Detectors, Inc.: *See*—
Thomas, Joe P.; Rogers, Charles D.; Noll, Richard R.; Peltzer, Harry E.; and Perrine, Steven P., 4,480,753, Cl. 209-546.000.
Metalmast Marine, Inc.: *See*—
Rosenfield, Norman A.; Rosenfield, Paul M.; and Jones, Robert H., 4,480,570, Cl. 114-106.000.
Metheny, Wayne W.: *See*—
Bareket, Noah; and Metheny, Wayne W., 4,480,916, Cl. 356-351.000.
Metz, Arthur J., to Tektronix, Inc. Feedback amplifier having a voltage-controlled compensation circuit. 4,481,480, Cl. 330-294.000.
Meyer, Daniel, to Communication Systems, Inc. Communication plug connection tool. 4,480,374, Cl. 29-566.400.
Meyer, Ralph F. Outboard motor auxiliary steering system. 4,480,571, Cl. 114-146.000.
Meyerand, Russell G., Jr.; Daigle, Louis L.; and Paine, Donald C., to United Technologies Corporation. Microprocessor controlled multifrequency AC converter. 4,481,456, Cl. 318-800.000.
Meynard, Jean-Yves, to Siplast, S.A. Method of assembling bituminous sealing elements. 4,481,245, Cl. 428-192.000.
Michaels, William J.: *See*—
Grimm, Duane H.; and Michaels, William J., 4,480,733, Cl. 192-8.00R.
Michel, Werner: *See*—
Schlak, Ottfried; Michel, Werner; and Munchenbach, Bernard, 4,481,341, Cl. 525-478.000.
Michelin Recherche et Technique S.A.: *See*—
Giron, Daniel G., 4,480,671, Cl. 152-209.00R.
Michelotti, Paul E. Low visibility runway monitor. 4,481,516, Cl. 340-933.000.
Michno, Drake M.: *See*—
Bodem, George B.; and Michno, Drake M., 4,481,287, Cl. 430-483.000.
Middleton, Jack C.: *See*—
McFarland, Archie R.; Middleton, Jack C.; and dos Santos, Claudio, 4,480,980, Cl. 425-131.100.
Migdal, Kevin J.: *See*—
Loge, David B.; Cole, William A.; and Migdal, Kevin J., 4,480,745, Cl. 206-44.00R.
Mikata, Hiromi: *See*—
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,480,684, Cl. 165-110.000.
Mikle, Kenneth: *See*—
Plummer, Lawrence L.; and Mikle, Kenneth, 4,480,975, Cl. 425-116.000.
Miller, Armin; and Merritt, Lauren V., to Datacopy Corporation. Method and apparatus for following a recorded data track with a read head. 4,481,550, Cl. 360-77.000.
Miller, Charles G.; and Stephens, James B., to Wilson Sales Co., Inc. Curtain for shrouding welding operations. 4,480,894, Cl. 350-167.000.
Miller, Darwin A., to Damco Testers, Inc. Hydrostatic test apparatus. 4,480,462, Cl. 73-37.000.
Miller, Robert C.; and Carr, Walter J., Jr., to Westinghouse Electric Corp. Method and apparatus for the detection of anomalies in rotating members. 4,481,471, Cl. 324-240.000.
Milliner, Ken M.: *See*—
Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., 4,480,982, Cl. 425-385.000.
Mills, Robert J. Boat mooring apparatus. 4,480,576, Cl. 114-230.000.
Milocco, Claudio: *See*—
Bianchi, Giuseppe; and Milocco, Claudio, 4,481,086, Cl. 204-78.000.
Milosh, Michael D.; and Geoghegan, Robert J., to Battelle Memorial Institute. Material splitter. 4,480,666, Cl. 144-194.000.
Milovidov, Boris A.; and Kaplunov, Iosif B., deceased (by Kaplunova, Nadezhda V., administrator), to Pavlodarsky Industrialny Institut. Device for determining heat losses due to incomplete fuel combustion. 4,481,168, Cl. 422-78.000.
Minakova, Sofya M.: *See*—
Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia F., administrator, 4,481,201, Cl. 424-250.000.
Minami, Koichi, to Tomy Kogyo Co., Inc. Toy having momentum imparting surface. 4,480,834, Cl. 273-85.00E.
Minamino, Hiromi: *See*—
Kondo, Mitsuo; Minamino, Hiromi; Otani, Yasuhisa; Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, 4,481,187, Cl. 424-63.000.
Minnema, Lourens; and van der Zande, Johan M. Photosensitive polyamic acid derivative, compound used in manufacture of derivative, method of manufacturing substrate having polyimide layer, and semiconductor device made from said method. 4,481,340, Cl. 525-426.000.
Minnesota Mining and Manufacturing Company: *See*—
Flink, Leslie R.; Fox, Bryce J.; and Witzel, Mary K., 4,480,393, Cl. 34-27.000.
Kolpe, Vasant V.; Sherman, Dudley M.; Hendrickson, William A.; and Chou, Hsin-hsin, 4,481,234, Cl. 427-71.000.
Mino, Yoshihito: *See*—
Ide, Yuichi; Tsuchiya, Yasutoshi; and Mino, Yoshihito, 4,480,442, Cl. 62-175.000.
Minolta Camera Kabushiki Kaisha: *See*—
Kubo, Souichi; and Okano, Yukio, 4,480,896, Cl. 350-431.000.
Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, to Daikin Kogyo Co., Ltd. Fluorine-containing phenyl benzoate compounds, and their production and use. 4,481,149, Cl. 260-465.00D.
Miseki, Kozo: *See*—
Takeda, Tsunezo; and Miseki, Kozo, 4,481,415, Cl. 250-292.000.
Mista, Kresimir: *See*—
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Misumi, Akira: *See*—
Ezawa, Masayoshi; Misumi, Akira; Suzuki, Kenkichi; and Kumada, Masaharu, 4,481,265, Cl. 429-9.000.
Mita Industrial Company Ltd.: *See*—
Iseki, Masahide; Nakajima, Tadanobu; Kajita, Hiroshi; and Kawamoto, Masuo, 4,481,275, Cl. 430-125.000.
Mitchell, David S., to Chevron Research Company. Solvent extraction method. 4,481,099, Cl. 208-11.0LE.
Mitel Corporation: *See*—
Matthews, Terrence H., 4,481,384, Cl. 179-18.0DA.
Mitote, Tamio: *See*—
Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, 4,481,149, Cl. 260-465.00D.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hatata, Minoru; and Gouda, Tadahiro, 4,481,629, Cl. 371-57.000.
Saito, Toyokazu; Sanmiya, Seietsu; Hosooka, Akio; Takashima, Kazuo; and Tanaka, Minoru, 4,481,534, Cl. 358-107.000.
Tsuchihashi, Michihiro; Otani, Katsuya; and Suzuki, Ryo, 4,481,446, Cl. 315-73.000.
Ueyama, Yoshiji, 4,480,484, Cl. 73-861.080.
Yoshida, Masayuki; Matsumoto, Fumio; and Otsuka, Shigeharu, 4,481,555, Cl. 361-155.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hirakawa, Tadashi; and Sasashige, Hiroaki, 4,481,066, Cl. 156-472.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Honma, Shigeo, 4,481,289, Cl. 430-532.000.
Mitsubishi Petrochemical Company Limited: *See*—
Fujii, Masaki; and Miyabayashi, Mitsutaka, 4,481,336, Cl. 525-323.000.

Mitsuboshi Belting Ltd.: *See*—
Imamura, Junji; and Matsumura, Kaname, 4,481,051, Cl. 156-137.000.
Mitsuhashi, Yasuo; and Uchiyama, Masaki, to Canon Kabushiki Kaisha. Developing powder having oinylic, crosslinked binder and olefin polymer. 4,481,274, Cl. 430-109.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Iino, Shinji; Nakamura, Akihiko; Maruyama, Kensaku; and Nakamura, Kohji, 4,481,175, Cl. 423-308.000.
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yokote, Sachio; Sekiguchi, Katsumi; Sasagawa, Katsuyoshi; and Imai, Masao, 4,481,131, Cl. 252-511.000.
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Miyabayashi, Mitsutaka: *See*—
Fujii, Masaki; and Miyabayashi, Mitsutaka, 4,481,336, Cl. 525-323.000.
Miyahara, Hatsuo: *See*—
Takemae, Yoshihiro; and Miyahara, Hatsuo, 4,481,610, Cl. 365-182.000.
Miyakawa, Yoshitaka: *See*—
Sato, Makoto; Miyakawa, Yoshitaka; Fujii, Etsuo; and Matsuda, Shohei, 4,480,876, Cl. 303-103.000.
Miyamoto, Akira: *See*—
Endoh, Hiromi; Uraki, Katsutoshi; and Miyamoto, Akira, 4,481,558, Cl. 361-303.000.
Miyamoto, Eiji, to Marumiya Shoko Co., Ltd. Back-splitting apparatus for use in production of books. 4,480,517, Cl. 83-210.000.
Miyasaka, Kiyoshi, to Fujitsu Limited. Semiconductor device. 4,481,526, Cl. 357-84.000.
Miyashita, Akira: *See*—
Kondo, Mitsuo; Minamino, Hiromi; Otani, Yasuhisa; Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, 4,481,187, Cl. 424-63.000.
Miyashita, Shunichu: *See*—
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Miyatuka, Hajime: *See*—
Matsufuji, Akihiro; Umemura, Shizuo; Kasuga, Akira; Miyatuka, Hajime; and Akashi, Goro, 4,481,253, Cl. 428-323.000.
Miyazawa, Toshio: *See*—
Yoshioka, Teruo; Miyazawa, Toshio; Uchida, Kuninobu; and Asai, Akimichi, 4,480,383, Cl. 29-822.000.
Mizeri, Alexandr A., administrator: *See*—
Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia F., administrator, 4,481,201, Cl. 424-250.000.
Mizuguchi, Ryuzo: *See*—
Ishii, Keizou; Mizuguchi, Ryuzo; Ishikura, Shinichi; and Yoshioka, Tamotsu, 4,481,150, Cl. 260-513.00N.
Mizuno, Kisaburo: *See*—
Kato, Shinichi; Motosugi, Katsuhiko; Takimoto, Masatami; Yamada, Haruo; Mizuno, Kisaburo; and Teramura, Mitsuyoshi, 4,480,606, Cl. 123-188.00M.
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Moatti, Jean-Claude P.: *See*—
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Mobil Oil Corporation: *See*—
Baldwin, Willett, 4,480,701, Cl. 175-45.000.
Chou, Tai-Sheng, 4,481,105, Cl. 208-146.000.
Chu, Pochen, 4,481,173, Cl. 423-277.000.
Heilweil, Israel, 4,481,120, Cl. 252-8.50A.
Kelly, John, Jr., 4,480,702, Cl. 175-66.000.
Kennedy, Clinton R.; and Krambeck, Frederick J ., 4,481,100, Cl. 208-11.00R.
Krambeck, Frederick J.; Nace, Donald M.; and Schipper, Paul H., 4,481,103, Cl. 208-120.000.
Nowlin, Thomas E.; and Wagner, Klaus P., 4,481,301, Cl. 502-104.000.
Park, Hee C., 4,481,058, Cl. 156-244.240.
Valyocsik, Ernest W., 4,481,177, Cl. 423-329.000.
Walsh, Dennis E., 4,481,104, Cl. 208-120.000.
Yan, Tsoung Y., 4,481,101, Cl. 208-50.000.
Mochida, Ei: *See*—
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; Mochida, Ei; and Mochida, Nobuo, 4,481,137, Cl. 260-112.00R.
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Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; Mochida, Ei; and Mochida, Nobuo, 4,481,137, Cl. 260-112.00R.
Mochida Pharmaceutical Co., Ltd.: *See*—
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; Mochida, Ei; and Mochida, Nobuo, 4,481,137, Cl. 260-112.00R.
Mohon, Windell N., to United States of America, Navy. Tolerancing device for a weapons fire simulator. 4,481,000, Cl. 434-20.000.
Mole, Alain M.; and Savoyet, Jean-Louis P. J. Electronic indentification system. 4,481,513, Cl. 340-825.310.
Moltner, Hermann, to Kocks Technik GmbH & Co. Plants for manufacturing seamless tubes. 4,480,457, Cl. 72-208.000.
Momose, Atsushi: *See*—
Asano, Yuichiro; Suzuki, Taira; Yabe, Tadashi; Kurita, Kunio; Ohga, Suehisa; Hirahashi, Akira; and Momose, Atsushi, 4,480,919, Cl. 356-376.000.
Momyer, William R.: *See*—
Littauer, Ernest L.; and Momyer, William R., 4,481,266, Cl. 429-12.000.
Monticelli, Dennis M.: *See*—
Sleeth, Robert S.; and Monticelli, Dennis M., 4,481,481, Cl. 330-296.000.
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, to International Flavors & Fragrances Inc. Process for augmenting or enhancing the tropical fruit aroma or taste of a foodstuff or chewing gum using a mixture of alcohols. 4,481,221, Cl. 426-3.000.
Mooney, John F.: *See*—
Curr, Thomas R.; and Mooney, John F., 4,481,636, Cl. 373-18.000.
Moore, Richard C.: *See*—
Hubbard, Winchester L.; and Moore, Richard C., 4,481,216, Cl. 424-300.000.
Moore, Sanders H.; and Dotson, Ronald L., to Olin Corporation. Removal of chlorate from electrolyte cell brine. 4,481,088, Cl. 204-98.000.
Moorehead, Eric L., to Union Oil Company of California. Method for producing maleic anhydride. 4,481,363, Cl. 549-260.000.
Morel, Jean, to Sames, S.A. Electrostatic painting method and apparatus. 4,481,228, Cl. 427-31.000.
Morelli, John A., to Automatic Connector, Inc. Angle plug connector. 4,480,887, Cl. 339-94.00C.
Moreno, Frederick E. Method and apparatus for extracting solids from a gas stream flowing in a pneumatic transport line. 4,481,019, Cl. 55-96.000.
Morganthaler, Mark: *See*—
Dukes, John N.; Bryson, Charles E., III; Weber, Lynn; and Morganthaler, Mark, 4,480,913, Cl. 356-319.000.
Mori, Atsushi: *See*—
Kobayashi, Yoshiaki; and Mori, Atsushi, 4,480,602, Cl. 123-73.0AD.
Mori, Keiji: *See*—
Sato, Mikio; Ogasawara, Asao; and Mori, Keiji, 4,480,404, Cl. 49-62.000.
Mori, Shinji: *See*—
Ando, Takayuki; and Mori, Shinji, 4,480,853, Cl. 280-801.000.
Moriguchi, Fujio: *See*—
Inui, Toshiharu; Moriguchi, Fujio; and Ohmori, Takashi, 4,481,518, Cl. 346-76.0PH.
Morishima, Satomi, to Toyota Jidosha Kabushiki Kaisha. Punch press die assembly with punch selecting mechanism. 4,480,782, Cl. 234-98.000.
Morishita Jintan Co., Ltd.: *See*—
Morishita, Takashi; Sunohara, Hideki; and Tanoue, Shohachi, 4,481,157, Cl. 264-4.100.
Morishita, Michio: *See*—
Kawai, Yukio; Morishita, Michio; Otsuki, Hiromi; and Kondo, Takashi, 4,480,661, Cl. 137-544.000.
Morishita, Takashi; Sunohara, Hideki; and Tanoue, Shohachi, to Morishita Jintan Co., Ltd. Method and apparatus for production of microcapsules. 4,481,157, Cl. 264-4.100.
Morita, Tamao. Clasp utilizing attractive force of permanent magnet. 4,480,361, Cl. 24-303.000.
Morrison, Robert H.: *See*—
Haigh, Leonard; and Morrison, Robert H., 4,480,382, Cl. 29-786.000.
Morton, James W., to General Electric Company. Apparatus for applying insulation to a coil lead. 4,481,063, Cl. 156-349.000.
Mortoren-und Turbinen-Union: *See*—
Kruger, Wolfgang; and Huther, Werner, 4,480,956, Cl. 416-97.00A.
Motornetics Corporation: *See*—
Welburn, Ross D., 4,481,453, Cl. 318-696.000.
Motorola, Inc.: *See*—
Abt, Edgar J., 4,480,550, Cl. 102-215.000.
Adams, Victor J.; and Polka, Frank, 4,480,983, Cl. 425-467.000.
Darnell, Robert D.; Goetz, Carl A.; and Ingle, William M., 4,480,989, Cl. 432-1.000.
Dworsky, Lawrence N., 4,481,488, Cl. 331-158.000.
Freeburg, Thomas A., 4,481,670, Cl. 455-33.000.
Kazor, Thomas R.; and Whitcomb, Jon P., 4,480,747, Cl. 206-334.000.
Kurby, Christopher N., 4,481,489, Cl. 332-19.000.
Lesk, Israel A., 4,481,378, Cl. 136-244.000.
Motosugi, Katsuhiko: *See*—
Kato, Shinichi; Motosugi, Katsuhiko; Takimoto, Masatami; Yamada, Haruo; Mizuno, Kisaburo; and Teramura, Mitsuyoshi, 4,480,606, Cl. 123-188.00M.
Motter Printing Press Co.: *See*—
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Moulin, Jean-Paul: *See*—
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Moussin, Claude: *See*—
Bedere, Serge; Borgoltz, Jean-Phillippe; and Moussin, Claude, 4,481,180, Cl. 423-446.000.
Mueller, Mark W., to AT&T Bell Laboratories. Method for distributing resources in a time-shared system. 4,481,583, Cl. 364-300.000.

Muka, Richard S., to Varian Associates, Inc. Heater assembly for thermal processing of a semiconductor wafer in a vacuum chamber. 4,481,406, Cl. 219-411.000.

Muller-Deinhardt, Friedhelm. Exercise hoop having a counter. 4,480,831, Cl. 272-128.000.

Muller, Friedhelm: *See*—
Sackmann, Gunter; Kolb, Gunter; Probst, Joachim; Muller, Friedhelm; and Baumgen, Heinz, 4,481,319, Cl. 524-213.000.

Muller, Jorg, to Siemens Aktiengesellschaft. Method for producing Schottky diodes. 4,481,041, Cl. 148-1.500.

Muller, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Arrangement for unloading and loading X-ray film cassettes. 4,480,423, Cl. 53-266.00R.

Muller, Rolf, to Papst-Motoren KG. Permanent magnet brushless d-c motor with isolated sensor winding means. 4,481,440, Cl. 310-268.000.

Munch, Ulrich: *See*—
Giesselmann, Ewald; and Munch, Ulrich, 4,481,220, Cl. 424-349.000.

Munchenbach, Bernard: *See*—
Schlak, Ottfried; Michel, Werner; and Munchenbach, Bernard, 4,481,341, Cl. 525-478.000.

Murakami, Teruo, to Tokyo Shibaura Denki Kabushiki Kaisha. Pregrooved optical-disk. 4,481,620, Cl. 369-275.000.

Muralidhara, Ranya; Pittet, Alan O.; Vock, Manfred H.; and Bowen, David R., to International Flavors & Fragrances Inc. Flavoring with alkylthioalkanal dialkyl mercaptals. 4,481,224, Cl. 426-535.000.

Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., to DeSoto, Inc. Ultraviolet curable basecoats for vacuum metallization. 4,481,093, Cl. 204-159.190.

Murphy, Richard F., to Holland Company. Snap-on slide bearing for recessed type guide lugs of unit brake beams. 4,480,721, Cl. 188-52.000.

Musikant, Barry L.: *See*—
Deutsch, Allan S.; and Musikant, Barry L., 4,480,997, Cl. 433-221.000.

Muterspaugh, Max W., to RCA Corporation. RF Prom tracking for tuners. 4,481,673, Cl. 455-180.000.

Muylle, Wilfried E., to AGFA-GEVAERT N.V. Method and apparatus for conveying and spreading material. 4,480,742, Cl. 198-689.000.

Mylius, Horst; Frania, Josef; and Ristic, Momcilo, to Wabco Fahrzeugbremsen GmbH. Mechanical quick-release mechanism for spring-loaded brake cylinders. 4,480,531, Cl. 92-29.000.

N P S P po Hydroplastichna Obrabotka na Metalite: *See*—
Petkov, Georgi K.; and Davidkov, Peter I., deceased, 4,480,453, Cl. 72-56.000.

Nace, Donald M.: *See*—
Krambeck, Frederick J.; Nace, Donald M.; and Schipper, Paul H., 4,481,103, Cl. 208-120.000.

Nachtkamp, Klaus; Bock, Manfred; Halpaap, Reinhard; and Pedain, Josef, to Bayer Aktiengesellschaft. Process for the production of combinations of organic polyisocyanates and at least partly blocked polyamines, the combinations obtainable by this process and their use for the production of lacquers, coating or sealing compositions. 4,481,345, Cl. 528-59.000.

Nagasaka, Hideo. Powder flow rate measuring apparatus. 4,480,947, Cl. 406-14.000.

Nagel, Dave D.: *See*—
Aparicio, Thomas, *Jr.*; Nagel, Dave D.; and Graham, Ron, 4,480,510, Cl. 81-57.390.

Nagle, Dennis C.: *See*—
Buchta, William M.; and Nagle, Dennis C., 4,481,052, Cl. 156-155.000.

Naito, Jiro; Yoneda, Yasuhiro; and Kitamura, Kenroh, to Fujitsu Limited. Dry-developing resist composition. 4,481,279, Cl. 430-280.000.

Nakae, Kiyohiko: *See*—
Fukushima, Nobuo; Nakae, Kiyohiko; and Terazawa, Takayuki, 4,481,254, Cl. 428-329.000.

Nakagawa, Akira: *See*—
Iwase, Takatoshi; Fuma, Kazunari; Nakagawa, Akira; and Hakamada, Kouhei, 4,480,456, Cl. 72-185.000.

Nakagawa, Katsuya; and Yamato, Satoshi, to Nintendo Co., Ltd. Signal transmitting system having spurious radiation preventing function. 4,481,426, Cl. 307-91.000.

Nakagawa, Yasuhiko: *See*—
Tange, Shoji; Imajyo, Minoru; Inoue, Ryuzaburo; and Nakagawa, Yasuhiko, 4,480,620, Cl. 123-478.000.

Nakahara, Yutaka; Haruna, Tohru; and Tobita, Etsuo, to Adeka Argus Chemical Co., Ltd. Hindered bisphenol diphosphonites and stabilized synthetic resin compositions containing the same. 4,481,317, Cl. 524-119.000.

Nakai, Masnoru; Ohshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, to Ube Industries, Inc. Process for preparing optically active tryptophanes. 4,481,362, Cl. 548-498.000.

Nakai, Shiro; and Baba, Takao, to Glory Kogyo Kabushiki Kaisha. Coin feeding apparatus for a coin disposing machine. 4,480,651, Cl. 133-3.00A.

Nakajima, Tadanobu: *See*—
Iseki, Masahide; Nakajima, Tadanobu; Kajita, Hiroshi; and Kawamoto, Masuo, 4,481,275, Cl. 430-125.000.

Nakamoto, Teruyuki: *See*—
Togawa, Tsuyoshi; Nakamoto, Teruyuki; Iwata, Mitsuo; Ito, Katuhiko; Sano, Hideo; Sekine, Nobutaka; and Shibuya, Tomoe, 4,480,981, Cl. 425-143.000.

Nakamura, Akihiko: *See*—
Iino, Shinji; Nakamura, Akihiko; Maruyama, Kensaku; and Nakamura, Kohji, 4,481,175, Cl. 423-308.000.

Nakamura, Kazuo: *See*—
Karaki, Kouichi; Oinoue, Kenichi; Tsukaya, Takashi; Terada, Katsumi; Yamasaki, Masafumi; Yusa, Atsushi; and Nakamura, Kazuo, 4,480,636, Cl. 128-6.000.

Nakamura, Kohji: *See*—
Iino, Shinji; Nakamura, Akihiko; Maruyama, Kensaku; and Nakamura, Kohji, 4,481,175, Cl. 423-308.000.

Nakamura, Taku: *See*—
Ogawa, Masashi; Ishigaki, Kunio; Iwasaki, Nobuyuki; and Nakamura, Taku, 4,481,284, Cl. 430-355.000.

Nakanishi, Akito: *See*—
Kazama, Hisao; Nakanishi, Akito; and Nakayama, Katsuichi, 4,480,474, Cl. 73-600.000.

Nakanishi, Kiyoshi: *See*—
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,480,625, Cl. 123-661.000.

Nakanishi, Yoshiyuki: *See*—
Sato, Takahisa; Nakanishi, Yoshiyuki; Maruyama, Keizo; and Suzuki, Takehiko, 4,481,304, Cl. 502-209.000.

Nakano, Yoshikatsu; and Matsuura, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Valve operation control apparatus in internal combustion engine. 4,480,617, Cl. 123-432.000.

Nakata, Haruo: *See*—
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,480,684, Cl. 165-110.000.

Nakayama, Katsuichi: *See*—
Kazama, Hisao; Nakanishi, Akito; and Nakayama, Katsuichi, 4,480,474, Cl. 73-600.000.

Nakayama, Mituhisa, to U.S. Philips Corporation. Loading device for a recording and/or playback apparatus. 4,481,618, Cl. 369-194.000.

Nalco Chemical Company: *See*—
Shannon, James E., 4,481,110, Cl. 210-199.000.

Nalence, Henry. Low tire pressure warning device. 4,480,580, Cl. 116-34.00R.

Nambang Corporation: *See*—
Ra, Chang H., 4,481,560, Cl. 362-84.000.

Namiki, Takayuki: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,481,196, Cl. 424-180.000.

Napolitano, James E.: *See*—
Bolton, Theodore S.; Napolitano, James E.; and Banner, Bruce T., 4,480,533, Cl. 98-38.00B.

Nashef, Aws S., to American Hospital Supply Corporation. Polymer incorporation into implantable biological tissue to inhibit calcification. 4,481,009, Cl. 8-94.110.

National Research Development Corporation: *See*—
Watkinson, Sarah C., 4,481,219, Cl. 424-319.000.

National Semiconductor Corporation: *See*—
Sleeth, Robert S.; and Monticelli, Dennis M., 4,481,481, Cl. 330-296.000.

Naypaver, Frank R. Water ski apparatus. 4,480,577, Cl. 114-253.000.

Nazem, Faramarz, to Union Carbide Corporation. Apparatus for controlling the cross-sectional structure of mesophase pitch derived fibers. 4,480,977, Cl. 425-192.00S.

Needham, Robert J.; and Blenkinsop, Philip T. Pet doors. 4,480,407, Cl. 49-168.000.

Needle Industries Limited: *See*—
Haigh, Leonard; and Morrison, Robert H., 4,480,382, Cl. 29-786.000.

Neff, Jerry L.: *See*—
Fernandez de Castro, Aurora; and Neff, Jerry L., 4,481,094, Cl. 204-180.00G.

Negishi, Fumio: *See*—
Ota, Akiho; and Negishi, Fumio, 4,481,163, Cl. 264-513.000.

Neils, William C.: *See*—
Berrigan, James H., 4,480,598, Cl. 123-41.270.

Nelson, Leslie W.: *See*—
Martin, Richard J.; Bondurant, David W.; and Nelson, Leslie W., 4,481,580, Cl. 364-200.000.

Nelson, Richard H.; Christensen, Ray G.; and Stedman, David, to Sea-Labs, Inc. Liquid fuel vaporizing burner. 4,480,986, Cl. 431-37.000.

Nelson, Robert E.: *See*—
Wach, Charles G.; Nelson, Robert E.; and Brak, Stephen B., 4,480,426, Cl. 53-576.000.

Nembach, Siegfried, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Hydro-mechanical multiple-wheel drive for self-driving heavy vehicles. 4,480,502, Cl. 74-733.000.

Nesheiwat, Donna M.: *See*—
Crosby, Wayne H.; Fulger, Charles V.; Haas, Gerhard J.; and Nesheiwat, Donna M., 4,481,226, Cl. 426-540.000.

Nestor, John J.; and Vickery, Brian H., to Syntex (U.S.A.) Inc. Nonapeptide and decapeptide analogs of LHRH useful as LHRH antagonists. 4,481,190, Cl. 424-177.000.

Neumann, Peter: *See*—
Eckell, Albrecht; Eilingsfeld, Heinz; Elzer, Albert; Feichtmayr, Franz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,481,272, Cl. 430-58.000.

Neutron Products Inc.: *See*—
Ransohoff, Jackson A., 4,481,652, Cl. 378-69.000.

New York Blood Center Inc.: *See*—
Prince, Alfred M., 4,481,189, Cl. 424-101.000.

Newburg, Betty, executrix: *See*—
Newburg, Norman R., deceased, 4,481,344, Cl. 526-283.000.

Newburg, Norman R., deceased (by Newburg, Betty, executrix), to Hercules Incorporated. Method for making thermoset poly(dicy-

clopentadiene) and the product so produced. 4,481,344, Cl. 526-283.000.
Newlove, John C.; Portnoy, Robert C.; Schulz, Donald N.; and Kitano, Kissho, to Exxon Research & Engineering Co. Fluid loss control in oil field cements. 4,480,693, Cl. 166-293.000.
NGK Insulators, Ltd.: *See—*
Koga, Shosuke; Koketsu, Mitsuru; Ohta, Yoshihiro; and Satomi, Seigo, 4,481,124, Cl. 252-62.000.
Nibbe, Bodo B.; and Hirsch, Paul. Device for cooking foods with microwaves. 4,481,392, Cl. 219-10.55E.
Nickipuck, Michael F. Locking socket wrench drive device. 4,480,511, Cl. 81-177.00G.
Nicolas, Jacques: *See—*
Goursat, Albert-Gilbert; Hersant, Thierry; and Nicolas, Jacques, 4,480,770, Cl. 222-590.000.
Niemi, Eero, to Valmet Oy. Procedure and means for changing a press fabric in the press section of a paper machine. 4,481,078, Cl. 162-199.000.
Niemiec, Albin J., to Vickers, Incorporated. Pump with inlet passages downstream and through its flow control valve. 4,480,962, Cl. 417-53.000.
Ninomiya, Ken: *See—*
Suzuki, Keizo; Hiraiwa, Atsushi; Takahashi, Shigeru; Nishimatsu, Shigeru; Ninomiya, Ken; and Okudaira, Sadayuki, 4,481,229, Cl. 427-38.000.
Nintendo Co., Ltd.: *See—*
Nakagawa, Katsuya; and Yamato, Satoshi, 4,481,426, Cl. 307-91.000.
Nippon Electric Co., Ltd.: *See—*
Ichikawa, Yoshio; and Umetsu, Shinjiro, 4,481,675, Cl. 455-343.000.
Okumura, Koichiro, 4,481,521, Cl. 357-23.000.
Tsujide, Tohru, 4,481,524, Cl. 357-42.000.
Nippon Paint Co., Ltd.: *See—*
Ishii, Keizou; Mizuguchi, Ryuzo; Ishikura, Shinichi; and Yoshioka, Tamotsu, 4,481,150, Cl. 260-513.00N.
Sakurai, Kiyomi; and Arimatsu, Seiji, 4,480,549, Cl. 101-456.000.
Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See—*
Sato, Takahisa; Nakanishi, Yoshiyuki; Maruyama, Keizo; and Suzuki, Takehiko, 4,481,304, Cl. 502-209.000.
Nippon Soken, Inc.: *See—*
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,480,619, Cl. 123-446.000.
Nippon Steel Corporation: *See—*
Saito, Toyokazu; Sanmiya, Seietsu; Hosooka, Akio; Takashima, Kazuo; and Tanaka, Minoru, 4,481,534, Cl. 358-107.000.
Nippon Telegraph & Telephone Public Corporation: *See—*
Okamoto, Katsunari; Hosaka, Toshihito; Sasaki, Yutaka; Noda, Juichi; and Edahiro, Takao, 4,480,897, Cl. 350-96.300.
Nippondenso Co., Ltd.: *See—*
Hattori, Yoshiyuki; and Matsui, Kazuma, 4,481,424, Cl. 290-38.00R.
Hori, Shinichi; Ohnishi, Yasuichi; and Ono, Makoto, 4,481,425, Cl. 290-51.000.
Iwase, Takatoshi; Fuma, Kazunari; Nakagawa, Akira; and Hakamada, Kouhei, 4,480,456, Cl. 72-185.000.
Kawai, Yukio; Morishita, Michio; Otsuki, Hiromi; and Kondo, Takashi, 4,480,661, Cl. 137-544.000.
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,480,614, Cl. 123-339.000.
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,480,443, Cl. 62-227.000.
Takasu, Yasuhito; Inoue, Shingo; and Iwata, Toshiharu, 4,480,615, Cl. 123-416.000.
Watanabe, Takashi; Sasage, Yoshihiro; and Kato, Hideaki, 4,481,450, Cl. 318-444.000.
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, to Nippondenso Co., Ltd. Automotive refrigeration system. 4,480,443, Cl. 62-227.000.
Nishide, Kiyoharu: *See—*
Hiyama, Tamejiro; and Nishide, Kiyoharu, 4,481,366, Cl. 556-431.000.
Nishihara, Motohisa: *See—*
Sato, Hideo; Nishihara, Motohisa; Yamada, Kazuji; and Suzuki, Seikou, 4,480,478, Cl. 73-708.000.
Nishimatsu, Shigeru: *See—*
Suzuki, Keizo; Hiraiwa, Atsushi; Takahashi, Shigeru; Nishimatsu, Shigeru; Ninomiya, Ken; and Okudaira, Sadayuki, 4,481,229, Cl. 427-38.000.
Nishino, Hisao; and Kondo, Shigeru, to Tohoku Metal Industries, Ltd. Circuit for driving a switching transistor. 4,481,431, Cl. 307-300.000.
Nissan Motor Company, Limited: *See—*
Fujioka, Kazuyoshi; and Eguchi, Shinsuke, 4,480,492, Cl. 74-467.000.
Hayashi, Yoshimasa, 4,480,609, Cl. 123-195.00C.
Imamura, Shuichiro; and Arakawa, Akira, 4,480,665, Cl. 139-97.000.
Takahashi, Kotei, 4,480,493, Cl. 74-467.000.
Tange, Shoji; Imajyo, Minoru; Inoue, Ryuzaburo; and Nakagawa, Yasuhiko, 4,480,620, Cl. 123-478.000.
Yamamori, Takahiro; and Iwanaga, Kazuyoshi, 4,480,500, Cl. 74-713.000.
Yamane, Ken, 4,480,439, Cl. 60-599.000.
Nisshin Kogyo Kabushiki Kaisha: *See—*
Idesawa, Isao, 4,480,726, Cl. 188-79.50P.
Nitto Chemical Industry Co., Ltd.: *See—*
Kanda, Shoichi; and Kawamura, Gengiro, 4,481,316, Cl. 524-93.000.
Nitzan, Abraham: *See—*
Brus, Louis E.; and Nitzan, Abraham, 4,481,091, Cl. 204-157.10R.
Niwa, Hideaki, to Kowa Company, Ltd. Reading-out apparatus. 4,481,666, Cl. 382-53.000.
Noda, Juichi: *See—*
Okamoto, Katsunari; Hosaka, Toshihito; Sasaki, Yutaka; Noda, Juichi; and Edahiro, Takao, 4,480,897, Cl. 350-96.300.
Noda, Kenichi: *See—*
Yabe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, 4,481,003, Cl. 445-49.000.
Noda, Shinji: *See—*
Tanaka, Yasunori; and Noda, Shinji, 4,480,583, Cl. 118-410.000.
Noguchi, Hitoshi; Akiyama, Tomoyuki; Akama, Hideo; Okara, Hideo; and Yoshino, Hisao, to Hewlett-Packard Company. Apparatus for measuring time variant device impedance. 4,481,464, Cl. 324-57.0PS.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, to Toyota Jidosha Kobyo Kabushiki Kaisha. Two-stroke cycle gasoline engine. 4,480,597, Cl. 123-51.0BA.
Nohmi, Takashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Aromatic polysulfone type resin hollow fiber membrane and process for producing the same. 4,481,260, Cl. 428-398.000.
Noll, Hans; Bangert, Wilfried; and Hacobs, Hans, to Klockner-Werke AG. Apparatus for performing a work function on a tubular workpiece. 4,480,821, Cl. 266-54.000.
Noll, Richard R.: *See—*
Thomas, Joe P.; Rogers, Charles D.; Noll, Richard R.; Peltzer, Harry E.; and Perrine, Steven P., 4,480,753, Cl. 209-546.000.
Nonaka, Toyokazu: *See—*
Masuda, Yugoro; Nonaka, Toyokazu; and Kawase, Shigeru, 4,481,256, Cl. 428-362.000.
Norden, Alexander R. Switching fusible apparatus. 4,481,496, Cl. 337-213.000.
Nordson Corporation: *See—*
Laucis, Peter K.; and Terry, Robert, 4,480,749, Cl. 206-459.000.
Spongh, Rolf T., 4,481,591, Cl. 364-513.000.
Norman, John H., to GA Technologies Inc. Hydrogen production from in situ partial burning of H_2S. 4,481,181, Cl. 423-573.00G.
North American Philips Corporation: *See—*
Wittig, Karl R., 4,481,477, Cl. 330-2.000.
Northern Telecom Limited: *See—*
Johnson, Courtenay P., 4,481,581, Cl. 364-200.000.
Li, Yuan-Lu; and Crane, Leslie J., 4,481,677, Cl. 455-617.000.
Nouvertne, Werner: *See—*
Serini, Volker; Nouvertne, Werner; and Freitag, Dieter, 4,481,338, Cl. 525-394.000.
Novik, Ofer: *See—*
Klier, Shimon; and Novik, Ofer, 4,480,632, Cl. 126-415.000.
Nowlin, Thomas E.; and Wagner, Klaus P., to Mobil Oil Corporation. Highly active catalyst composition for polymerizing alpha-olefins. 4,481,301, Cl. 502-104.000.
Nozawa, Ryoichiro; and Kiya, Nobuyuki, to Fanuc Limited. File deletion method in bubble cassette memory, and bubble cassette memory control apparatus. 4,481,606, Cl. 364-900.000.
Nukem GmbH: *See—*
Huschelrath, Gerhard; Kowol, Ewald; and Orthen, Ursula, 4,480,477, Cl. 73-643.000.
Nunn, Timothy A.: *See—*
Kurtz, Anthony D.; Mallon, Joseph R., Jr.; and Nunn, Timothy A., 4,481,497, Cl. 338-2.000.
Nuovo Pignone S.p.A.: *See—*
Vinciguferra, Costantino, 4,480,814, Cl. 251-292.000.
Nuvatec, Inc.: *See—*
McGowan, Michael J.; Slavik, William H.; and Cash, Carson D., III, 4,481,589, Cl. 364-474.000.
N.V. Nederlandse Gasunie: *See—*
Gerrit, Woudstra, 4,481,474, Cl. 324-425.000.
Nyilas, Emery; and Chiu, Tin-Ho, to Children's Medical Center Corporation, The. Bioresorbable polyesters and polyester composites. 4,481,353, Cl. 528-303.000.
O.R.M.A.C. S.p.A. dei F.LLI CUCCHETTI & CO.: *See—*
Cucchetti, Celeste; and Cucchetti, Pietro, 4,480,584, Cl. 118-411.000.
Oakes, John, to Lever Brothers Company. Bleach compositions. 4,481,129, Cl. 252-186.410.
Obama, Masao, to Tokyo Shibaura Denki Kabushiki Kaisha. Joint device. 4,480,495, Cl. 74-479.000.
Obata, Hiroyuki; Takamizawa, Minoru; and Inoue, Yoshio, to Dai Nippon Printing Co., Ltd.; and Shin-Etsu Chemical Co. Dry planographic plates for direct printing with elastomer underlayer. 4,481,282, Cl. 430-303.000.
Oberg, Per O.; and Osterlund, Seth A. O., to Sanera Projecting Aktiebolag. Apparatus for reeling floating booms, particularly such as are self-expanding. 4,480,800, Cl. 242-55.000.
O'Brien, Orlin P. Apparatus for three-wire method of thread pitch diameter measurement. 4,480,388, Cl. 33-199.00R.
Occidental Chemical Corporation: *See—*
DiGiacomo, Peter M., 4,481,087, Cl. 204-95.000.
Lin, Henry C.; and Cotter, Byron R., 4,481,370, Cl. 564-394.000.
Ochsner, Brandt P., to Teledyne Industries, Inc. Multiconfigural computers utilizing a time-shared bus. 4,481,572, Cl. 364-200.000.
Ochsner, Paul A.: *See—*
Gonzenbach, Hans U.; and Ochsner, Paul A., 4,481,133, Cl. 252-522.00R.
O'Connell, Thomas E.: *See—*
Winfree, Jules P.; Chin, Herbert A.; and O'Connell, Thomas E., 4,481,047, Cl. 148-429.000.

Octopus Systems, Inc.: *See*—
Smith, William W., 4,480,966, Cl. 417-332.000.

Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., to Haggar Company. Apparatus for adhesive strip application. 4,481,067, Cl. 156-541.000.

Office Specialty Division of Hollanding Inc.: *See*—
Young, William W., 4,480,883, Cl. 312-220.000.

Ogasawara, Asao: *See*—
Sato, Mikio; Ogasawara, Asao; and Mori, Keiji, 4,480,404, Cl. 49-62.000.

Ogawa, Masaki; Hirata, Yasushi; and Tsuchikura, Akira, to Bridgestone Tire Company, Ltd. Rubber compositions comprisining an alkadiene sulfone an carbon black. 4,481,327, Cl. 524-432.000.

Ogawa, Masashi; Ishigaki, Kunio; Iwasaki, Nobuyuki; and Nakamura, Taku, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,481,284, Cl. 430-355.000.

Oguchi, Yoshihiro: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, 4,481,273, Cl. 430-59.000.

Oguma, Tomio, to Aisin Seiki Kabushiki Kaisha. System for controlling transmission ratio of transmission for automotive vehicles. 4,480,504, Cl. 74-868.000.

Ohara, Osamu; and Kishimoto, Kazuo, to Teijin Chemicals, Ltd. Polycarbonate resin composition. 4,481,330, Cl. 525-67.000.

Ohga, Suehisa: *See*—
Asano, Yuichiro; Suzuki, Taira; Yabe, Tadashi; Kurita, Kunio; Ohga, Suehisa; Hirahashi, Akira; and Momose, Atsushi, 4,480,919, Cl. 356-376.000.

Ohmori, Takashi: *See*—
Inui, Toshiharu; Moriguchi, Fujio; and Ohmori, Takashi, 4,481,518, Cl. 346-76.0PH.

Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; Mochida, Ei; and Mochida, Nobuo, to Mochida Pharmaceutical Co., Ltd. Glycoproteins and processes for their production. 4,481,137, Cl. 260-112.00R.

Ohnishi, Yasuichi: *See*—
Hori, Shinichi; Ohnishi, Yasuichi; and Ono, Makoto, 4,481,425, Cl. 290-51.000.

Ohshima, Tokio: *See*—
Nakai, Mamoru; Ohshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, 4,481,362, Cl. 548-498.000.

Ohta, Hiromi: *See*—
Mandai, Tomomasa; Ohta, Hiromi; Yamazaki, Tadashi; and Urakawa, Yoshihisa, 4,480,987, Cl. 431-304.000.

Ohta, Yoshihiro: *See*—
Koga, Shosuke; Koketsu, Mitsuru; Ohta, Yoshihiro; and Satomi, Seigo, 4,481,124, Cl. 252-62.000.

Ohya, Shizuko: *See*—
Tachibana, Shinro; Araki, Kengo; Ohya, Shizuko; and Yoshida, Seiji, 4,481,138, Cl. 260-112.50R.

Oiles Kogyo Kabushiki Kaisha: *See*—
Izeki, Jiro; and Shimoda, Ikuo, 4,480,731, Cl. 188-381.000.

Oinoue, Kenichi: *See*—
Karaki, Kouichi; Oinoue, Kenichi; Tsukaya, Takashi; Terada, Katsumi; Yamasaki, Masafumi; Yusa, Atsushi; and Nakamura, Kazuo, 4,480,636, Cl. 128-6.000.

Ojstrsek, Lawrence J.: *See*—
Smith, James G.; and Ojstrsek, Lawrence J., 4,480,774, Cl. 224-205.000.

Okabayashi, Makoto; Takeishi, Yasuo; Higuchi, Yoichi; and Taguchi, Kazuto, to Osaka Gas Company, Limited. Surface combustion type burner with air supply entirely as primary air. 4,480,988, Cl. 431-329.000.

Okada, Kenzo: *See*—
Kondo, Mitsuo; Minamino, Hiromi; Otani, Yasuhisa; Miyashita, Akira; Okada, Kenzo; and Kuramoto, Takashi, 4,481,187, Cl. 424-63.000.

Okamoto, Katsunari; Hosaka, Toshihito; Sasaki, Yutaka; Noda, Juichi; and Edahiro, Takao, to Nippon Telegraph & Telephone Public Corporation. Single-polarization single-mode optical fiber. 4,480,897, Cl. 350-96.300.

Okamoto, Kenji, to Sanken Sangyo Kabushiki Kaisha. Method of heating a furnace. 4,480,992, Cl. 432-18.000.

Okano, Yukio: *See*—
Kubo, Souichi; and Okano, Yukio, 4,480,896, Cl. 350-431.000.

Okara, Hideo: *See*—
Noguchi, Hitoshi; Akiyama, Tomoyuki; Akama, Hideo; Okara, Hideo; and Yoshino, Hisao, 4,481,464, Cl. 324-57.0PS.

Okazaki, Tatsuo. Pot-typed water purifier with electrolyzer. 4,481,096, Cl. 204-265.000.

Okita, Tsutomu: *See*—
Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, 4,481,231, Cl. 427-44.000.

Oku, Teruo: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,481,196, Cl. 424-180.000.

Okudaira, Sadayuki: *See*—
Suzuki, Keizo; Hiraiwa, Atsushi; Takahashi, Shigeru; Nishimatsu, Shigeru; Ninomiya, Ken; and Okudaira, Sadayuki, 4,481,229, Cl. 427-38.000.

Okumura, Koichiro, to Nippon Electric Co., Ltd. Insulated gate field effect transistor provided with a protective device for a gate insulating film. 4,481,521, Cl. 357-23.000.

Okumura, Shuichi. Rail fastening device. 4,480,787, Cl. 238-264.000.

Okumura, Takeshi: *See*—
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,480,625, Cl. 123-661.000.

Okumura, Yoshiharu; Sakakibara, Tadamori; and Kaneko, Katsumi, to Toa Nenryo Kogyo Kabushiki Kaisha. Method of manufacturing ketones. 4,481,373, Cl. 568-401.000.

Oldani, Melchiorre: *See*—
Teglund, Lars; Kosonen, Pentti; and Oldani, Melchiorre, 4,480,655, Cl. 137-132.000.

Olin Corporation: *See*—
Moore, Sanders H.; and Dotson, Ronald L., 4,481,088, Cl. 204-98.000.

Olson, Jerry M., to United States of America, Energy. Method and apparatus for producing high purity silicon. 4,481,232, Cl. 427-51.000.

Olson, Raymond N.: *See*—
Mehl, Byron R.; Olson, Raymond N.; and Glennon, Timothy F., 4,481,459, Cl. 322-10.000.

Olympus Optical Co., Ltd.: *See*—
Karaki, Kouichi; Oinoue, Kenichi; Tsukaya, Takashi; Terada, Katsumi; Yamasaki, Masafumi; Yusa, Atsushi; and Nakamura, Kazuo, 4,480,636, Cl. 128-6.000.
Yanagida, Tuneo, 4,481,548, Cl. 360-44.000.

Omata, Tetsuo: *See*—
Nakai, Mamoru; Ohshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, 4,481,362, Cl. 548-498.000.

Omori, Hiroshi: *See*—
Anahara, Meiji; Suzuki, Yoshihisa; Takasu, Shigeru; and Omori, Hiroshi, 4,480,435, Cl. 57-333.000.

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Macht, Jon A.; and Clark, Brian C., 4,480,708, Cl. 180-6.480.
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Zucal, Thomas A.; and McIntosh, John D., 4,481,297, Cl. 436-181.000.
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Kukes, Simon G.; and Banks, Robert L., 4,481,377, Cl. 585-646.000.
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Platt, Nigel D., to IBC Transport Containers, Ltd. Bulk transport bag. 4,480,766, Cl. 222-105.000.
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King, Patrick F.; and Stroud, Stephen G., 4,481,278, Cl. 430-225.000.
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Ponzi, Joseph J., to International Telephone and Telegraph Corporation. Vibration instrument. 4,480,461, Cl. 73-32.00A.
Ponziani, Louis Fiore, to Cooper Industries, Inc. Driving tool for tamper resistant screw. 4,480,514, Cl. 81-461.000.
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Prince, Alfred M., to New York Blood Center Inc. Process for preparing sterilized plasma and plasma derivatives. 4,481,189, Cl. 424-101.000.
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Ra, Chang H., to Nambang Corporation. Safety lamp with noctilucent lens holder. 4,481,560, Cl. 362-84.000.
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Schmack, Hans-Jurgen; and Rauth, Erich, 4,481,621, Cl. 370-3.000.
Rav Shemesh B.M.: *See*—
Ostrovsky, Izhar, 4,480,635, Cl. 126-445.000.

Ravizza, Raymond F., to Ampex Corporation. Automatic tracking system with apparatus to prevent mistracking by a limited range transducer during stop motion. 4,481,544, Cl. 360-10.200.

Ray, Malcolm G.: *See—*
Lehman, F. Allen; Sleffel, William M.; and Ray, Malcolm G., 4,481,503, Cl. 340-518.000.

Raychem Corporation: *See—*
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., 4,481,498, Cl. 338-20.000.

Rayman, Theodore A.: *See—*
Sachleben, Harold G.; and Rayman, Theodore A., 4,480,805, Cl. 242-157.00R.

Raymond International Builders, Inc.: *See—*
Phares, Lindsey J., 4,480,944, Cl. 405-223.000.

Raymond, Wynn R., to Coca-Cola Company, The. Process for the generation of acetaldehyde from ethanol. 4,481,292, Cl. 435-147.000.

Raytheon Company: *See—*
Campbell, Richard A., 4,481,484, Cl. 331-12.000.
Cooper, Kersi F.; and Drake, Jerry W., 4,481,263, Cl. 428-620.000.
Flink, John A.; and Vinn, Charles L., 4,481,478, Cl. 330-253.000.
Hartnett, Thomas M.; Gentilman, Richard L.; and Maguire, Edward A., 4,481,300, Cl. 501-98.000.
Margerum, Donald L., 4,481,519, Cl. 343-434.000.

RCA Corporation: *See—*
Battson, Donald F.; and Savoye, Eugene D., 4,481,538, Cl. 358-213.000.
Christopher, Todd J., 4,481,429, Cl. 307-296.00R.
Colton, Robert M., 4,481,565, Cl. 363-56.000.
Fisher, Eldon M.; and Elder, Richard B., 4,481,433, Cl. 307-546.000.
Hanak, Joseph J., 4,481,230, Cl. 427-39.000.
Jastrzebski, Lubomir L.; and Levine, Peter A., 4,481,522, Cl. 357-24.000.
Matey, James R., 4,481,616, Cl. 369-58.000.
Meise, William H.; and Dischert, Robert A., 4,481,539, Cl. 358-213.000.
Muterspaugh, Max W., 4,481,673, Cl. 455-180.000.
Sasaki, Akira; and Davis, William J., 4,481,509, Cl. 340-728.000.
Taylor, Byron K.; and Stewart, Myron C., 4,481,614, Cl. 369-43.000.

Read, Eileen; and McCaughan, Daniel V., to General Electric Company, P.l.c., The. Force sensor with a piezoelectric FET. 4,480,488, Cl. 73-862.680.

REB Manufacturing, Inc.: *See—*
Risner, Melvin G., 4,480,719, Cl. 187-8.520.

Rebel, Herbert; and Herold, Manfred, to M.A.N. Roland Druckmaschinen AG. Device for varnishing systems to prevent varnish drying in out of paper size side zones of rollers. 4,480,548, Cl. 101-426.000.

Recchuite, Alexander D., to Sun Research and Development Co. Process of sulfurizing lard oil and an olefin and resultant product. 4,481,140, Cl. 260-399.000.

Rece, Wesley J., to R. A. Jones & Co. Inc. Auxiliary flap sealer for a cartoning machine. 4,480,421, Cl. 53-75.000.

Reeves, Dennis J., to Farley Metals, Inc. Nickel-coated aluminum racing horseshoe. 4,480,698, Cl. 168-4.000.

Regal International, Inc.: *See—*
Springer, Virgil E., 4,480,843, Cl. 277-31.000.

Regensburger, Werner, to SFS Stadler AG. Self-drilling screw. 4,480,951, Cl. 408-224.000.

Regie Nationale des Usines Renault: *See—*
Chamdru, Jacques, 4,480,865, Cl. 294-87.00R.

Regis, Helmut A. Board game. 4,480,836, Cl. 273-248.000.

Reichmanis, Elsa; and Smolinsky, Gerald, to AT&T Bell Laboratories. Bilevel resist. 4,481,049, Cl. 156-643.000.

Reid, Douglas J.: *See—*
Campbell, Nicoll A. D.; Dyer, Henry B.; Dietrich, Rainer; Phaal, Cornelius; and Reid, Douglas J., 4,481,016, Cl. 51-295.000.

Reier, Gerald J. Filter bag assembly. 4,481,022, Cl. 55-341.00R.

Reilama, Ismo; Vainiotalo, Arto; and Yrjala, Illmo, to Rauma-Rapola Oy. Process for the preparation of a sodium sulphite containing liquor. 4,481,074, Cl. 162-36.000.

Reimer, William A., to GTE Automatic Electric Inc. Cable clamp. 4,480,808, Cl. 248-73.000.

Reith, Walter; and Walter, Lothar, to SKF Kugellagerfavriken GmbH. Rolling bearing arrangement for lengthwise movement of a housing on one or two mutually parallel rails. 4,480,879, Cl. 308-6.00C.

Renaud, Andre ; and Chauviere, Henri, to Etudes Techniques et Representations Industrielles E.T.R.I. Electric motor, process for mounting, and wiring subassembly. 4,481,436, Cl. 310-71.000.

Renaud, Patrick; and Bourget, Jean-Paul, to Societe d'Etudes de Machines Thermiques S.E.M.T. Fuel injector with gear-driven calibration of needle. 4,480,792, Cl. 239-533.600.

Rengo Co., Ltd.: *See—*
Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, 4,481,053, Cl. 156-157.000.

Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Recirculating pump for motor vehicle brake system. 4,480,877, Cl. 303-116.000.

Research Engineering & Manufacturing: *See—*
Chapman, Eugene K., 4,480,506, Cl. 76-4.000.

Rexnord Inc.: *See—*
Raske, Theodore F.; and Lee, Phillip L., 4,480,705, Cl. 177-50.000.

Rhein, Robert A.; Baldwin, James C.; and Beach, Charles L., to United States of America, Navy. Compositions for extinguishing titanium fires. 4,481,119, Cl. 252-2.000.

Rhoades, Thomas S.: *See—*
Scott, David R.; and Rhoades, Thomas S., 4,480,480, Cl. 73-769.000.

Rhodin, Geran. Boiler having a pumping effect. 4,480,590, Cl. 122-13.00R.

Rich, Donald S., to Thomas & Betts Corporation. Wire stripper having rotary driving means. 4,480,508, Cl. 81-9.50R.

Richards, Randall G., to Drackett Company, The. Passive dispenser. 4,480,341, Cl. 4-228.000.

Richey, Jarold L., to Harris Graphics Corporation. Selective spot glue system. 4,481,068, Cl. 156-548.000.

Richter Gedeon Vegyeszeti Gyar R.T.: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo , 4,481,204, Cl. 424-262.000.

Ricoh Company, Ltd.: *See—*
Hashimoto, Mitsuru; Sakai, Kiyoshi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, legal representative, 4,481,271, Cl. 430-57.000.

Ricoh Systems, Inc.: *See—*
Kubota, Tomio; and Wurster, Herbert K., 4,481,270, Cl. 430-55.000.

Rideout, Janet L.; and Krenitsky, Thomas A., to Burroughs Wellcome Co. Anti-inflammatory deoxyribosides. 4,481,197, Cl. 424-180.000.

Rieter Machine Works Limited: *See—*
Wurmli, Arthur, 4,480,740, Cl. 198-400.000.

Riew, Changkiu K., to B. F. Goodrich Company, The. Hydroxyl containing liquid polymers. 4,481,148, Cl. 260-465.400.

Riise, Morris M., to International Sludge Reduction Company. Sludge dewatering system. 4,481,114, Cl. 210-702.000.

Ring, Curtis P., to Deere & Company. Pump swashplate control assist. 4,480,963, Cl. 417-216.000.

RIS Irrigation Systems: *See—*
Costa, Robert B., 4,480,856, Cl. 285-5.000.

Risner, Melvin G., to REB Manufacturing, Inc. Lift platform retainer. 4,480,719, Cl. 187-8.520.

Risser, Dale M.: *See—*
Martin, Eugene G.; Martin, Harold C.; and Risser, Dale M., 4,480,353, Cl. 17-11.000.

Ristic, Momcilo: *See—*
Mylius, Horst; Frania, Josef; and Ristic, Momcilo, 4,480,531, Cl. 92-29.000.

Ritchie, Leon T.: *See—*
Hopkins, John R.; and Ritchie, Leon T., 4,480,888, Cl. 339-74.00R.

Rittmann, Friedrich: *See—*
Zollner, Dieter; Conradty, Claudio; and Rittmann, Friedrich, 4,481,500, Cl. 373-93.000.

Ritz, Jurgen: *See—*
Hesse, Wolfgang; Ritz, Jurgen; and Zimmermann, Rolf, 4,481,311, Cl. 523-424.000.

Roady, Daniel K.: *See—*
Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., 4,481,067, Cl. 156-541.000.

Robbins, Carl A., to Halliburton Company. Borehole spectral analog to digital converter. 4,481,597, Cl. 364-604.000.

Robert Bosch GmbH: *See—*
Hauler, Peter; Rothley, Manfred; and Zabler, Erich, 4,481,469, Cl. 324-174.000.
Hoppel, Rainer, 4,480,621, Cl. 123-493.000.
Horrwarth, Ernst; Schweikert, Karl; and Weckerle, Hans J., 4,480,380, Cl. 29-736.000.
Matzold, Uwe; and Heiss, Dieter, 4,481,671, Cl. 455-92.000.

Robert Jenkins & Co.: *See—*
Greenfield, Alan, 4,481,399, Cl. 219-60.200.

Roberts, Allen W.; McFarland, Harold L., Jr.; and Lau, Harlan, to Elxsi. High speed data bus system. 4,481,625, Cl. 370-85.000.

Roberts, Stanley: *See—*
Bouldin, Dennis P.; Hallock, Dale P.; Roberts, Stanley; and Ryan, James G., 4,481,046, Cl. 148-188.000.

Robertson, David S., to British Petroleum Company Limited, The. Method for demulsifying water-in-oil emulsions. 4,481,130, Cl. 252-328.000.

Robinson, David W., to Robinson Insulation Co. Method and composition to avoid ash build-up. 4,480,593, Cl. 122-379.000.

Robinson Insulation Co.: *See—*
Robinson, David W., 4,480,593, Cl. 122-379.000.

Robinson, Ramon K.: *See—*
Grant, Nicholas J.; and Robinson, Ramon K., 4,481,034, Cl. 75-236.000.

Robinson, Raymond S.: *See—*
Kaufman, Harold R.; Robinson, Raymond S.; and Hughes, William E., 4,481,062, Cl. 156-345.000.

Robinson, Samuel C.; Dodge, William G.; and Pollard, Roy E., to United States of America, Energy. System for maintaining the alignment of mandrels in filament winding operations. 4,480,798, Cl. 242-18.00R.

Rockwell International Corporation: *See—*
Perkins, William C., 4,481,501, Cl. 340-310.00R.

Rodal, David R., to Ampex Corporation. Power fail servo system. 4,481,449, Cl. 318-375.000.

Rodriguez, Federico B.; and Mares, Rafael B., to Vitro Tec Fideicomiso. Glass annealing lehr. 4,481,025, Cl. 65-348.000.

Rody, Jean; and Slongo, Mario, to Ciba-Geigy Corporation. Polyalkylpiperidine light stabilizers. 4,481,315, Cl. 524-89.000.

Roedel, Hilmar: *See—*
Dinkel, Rolf; Roedel, Hilmar; and Grayson, James I., 4,481,361, Cl. 546-251.000.

Rogers, Charles D.: *See—*
Thomas, Joe P.; Rogers, Charles D.; Noll, Richard R.; Peltzer, Harry E.; and Perrine, Steven P., 4,480,753, Cl. 209-546.000.
Rogers, John V.: *See—*
Gough, Martin J.; and Rogers, John V., 4,481,154, Cl. 261-94.000.
Rogers, Philip C.: *See—*
Dodson, David L.; Pate, Bruce D.; and Rogers, Philip C., 4,481,176, Cl. 423-322.000.
Rogier, Edgar R.: *See—*
Gladfelter, Elizabeth J.; and Rogier, Edgar R., 4,481,348, Cl. 528-103.000.
Rohr, Robert D.: *See—*
Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., 4,480,413, Cl. 51-435.000.
Rolfe, John A.: *See—*
Gillam, David R.; and Rolfe, John A., 4,481,388, Cl. 200-51.00R.
Rolland, Michel: *See—*
Dubois, Jean C.; Gazzrd, Maryse; Schue, Francois; Giral, Louis; Rolland, Michel; and Aldissi, Mahmoud, 4,481,132, Cl. 252-519.000.
Rolls-Royce Limited: *See—*
Smith, Stanley, 4,480,970, Cl. 418-15.000.
Roneo Alcatel Limited: *See—*
Gilham, Dennis T.; Williams, Thomas D.; Ananthan, Manickam; and Herring, William J., 4,481,604, Cl. 364-900.000.
Ronnow, Peter: *See—*
Thomsen, Ove; and Ronnow, Peter, 4,481,293, Cl. 435-167.000.
Roos, Erm; and Talbert, Robert L., to Coulter Electronics, Inc. Pulse amplifying system. 4,481,466, Cl. 324-71.100.
Root, Ernest F.: *See—*
Thompson, Duane T.; Karas, Edwin L.; Root, Ernest F.; and Schlyter, Fredrik, 4,480,914, Cl. 356-346.000.
Root, Jon C.; Barnes, John F.; and Rosson, Dennis M., to Witco Chemical Corporation. Lubricant compositions. 4,481,122, Cl. 252-32.70E.
Rose, Jochen, to International Standard Electric Corporation. Multistage rotary switch. 4,481,386, Cl. 200-11.00R.
Rosen, Marvin: *See—*
Hall, Larry K.; and Rosen, Marvin, 4,481,324, Cl. 524-312.000.
Rosenbaum, Larry A., to Hancor, Inc. Coupling structure for plastic pipe or tubing. 4,480,855, Cl. 285-3.000.
Rosenfield, Norman A.; Rosenfield, Paul M.; and Jones, Robert H., to Metalmast Marine, Inc. Mainsail furling mast assembly and mast construction therefor. 4,480,570, Cl. 114-106.000.
Rosenfield, Paul M.: *See—*
Rosenfield, Norman A.; Rosenfield, Paul M.; and Jones, Robert H., 4,480,570, Cl. 114-106.000.
Rosenthal, Robert D., to Trebor Industries, Inc. Automatically determining the test weight per bushel of grain. 4,480,706, Cl. 177-50.000.
Rosenthal Technik AG: *See—*
Kuhl, Martin, 4,481,056, Cl. 156-180.000.
Ross, Alexander, to Burroughs Corporation. Etching depth monitor. 4,481,061, Cl. 156-345.000.
Rosson, Dennis M.: *See—*
Root, Jon C.; Barnes, John F.; and Rosson, Dennis M., 4,481,122, Cl. 252-32.70E.
Rostrup-Nielsen, Jens R.: *See—*
Jorn, Ernest; and Rostrup-Nielsen, Jens R., 4,481,305, Cl. 518-705.000.
Roth, David W., to 2500 Corporation, The. Floor mat mounting system. 4,481,240, Cl. 428-95.000.
Roth, James E., to Intertherm Inc. Electrical heater rack assembly with stand-off insulators. 4,481,411, Cl. 219-532.000.
Rothley, Manfred: *See—*
Hauler, Peter; Rothley, Manfred; and Zabler, Erich, 4,481,469, Cl. 324-174.000.
Roto-Finish Company, Inc.: *See—*
Balz, Gunther W.; and Upjohn, Henry L., 4,480,411, Cl. 51-163.100.
Rubin, David, to Schwimmer, Adolf; Schwartz, Irwin S.; Rubin, David; and Century Science Corp. Method for the treatment of tumors with β-glucuronidase activity dependent pharmaceuticals. 4,481,195, Cl. 424-180.000.
Rueckl, Todd J.; and Pahnke, Craig T., to W. R. Grace & Co. Flexible connector for flat wall ducting. 4,480,859, Cl. 285-163.000.
Ruetz, Lothar: *See—*
Bruck, Dieter W.; Jeblick, Werner; and Ruetz, Lothar, 4,481,321, Cl. 524-243.000.
Ruf, Wolfgang: *See—*
Wagensonner, Eduard; Krekeler, Ulrich; and Ruf, Wolfgang, 4,481,530, Cl. 358-44.000.
Ruhrchemie Aktiengesellschaft: *See—*
Lusch, Jurgen; Lieder, Bernhard; Heinen, Heinrich; and Kolodzey, Wolfgang, 4,481,015, Cl. 48-202.000.
Ruhrkohle Aktiengesellscaft: *See—*
Weskamp, Wilhelm; and Stewen, Wilhelm, 4,481,011, Cl. 44-51.000.
Rule, Mark, to Eastman Kodak Company. Infrared radiation absorbent anthraquinone derivatives in polyester compositions. 4,481,314, Cl. 524-88.000.
Rumpel, Manfred, to Ford Motor Company. Independent rear wheel suspension having a pivotable connection between two transverse control arms. 4,480,852, Cl. 280-663.000.
Rundell, Herbert A.; and Campsey, Ronald L., to Texaco Inc. Method and bridge plug for sealing off a well. 4,480,688, Cl. 166-123.000.
Russell, Robert J. Adjustable air inlet control system. 4,480,558, Cl. 110-297.000.
Russell, Robert J.: *See—*
Beauchesne, Robert C.; and Russell, Robert J., 4,481,627, Cl. 371-21.000.
Ryan, James G.: *See—*
Bouldin, Dennis P.; Hallock, Dale P.; Roberts, Stanley; and Ryan, James G., 4,481,046, Cl. 148-188.000.
Ryder International Corporation: *See—*
Thomas, Michael D., 4,480,762, Cl. 215-273.000.
Ryer, Richard N., II, to Platt Saco Lowell Corporation. Rotor cleaning. 4,480,433, Cl. 57-302.000.
Ryobi Ltd.: *See—*
Fujisawa, Nobuhiko; Tanibe, Shozo; and Hujiki, Tatsunori, 4,480,545, Cl. 101-183.000.
Sazaki, Kounin, 4,480,803, Cl. 242-84.20G.
S&C Electric Company: *See—*
Jarosz, John M.; and Panas, William R., 4,481,495, Cl. 337-159.000.
S.N.E.C.M.A.: *See—*
Bourguignon, Serge P. L.; Choque, Raymond R.; and Pham, Lucien P., 4,480,959, Cl. 416-220.00R.
S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl-Gustav; and Bergstrom, Per-Olof, 4,480,503, Cl. 74-766.000.
Saab-Scania Aktiebolag: *See—*
Kreij, Sven E., 4,480,815, Cl. 251-298.000.
SAB Industri AB: *See—*
Bengtsson, Nils K.; and Ljung, Egil K., 4,480,727, Cl. 188-165.000.
Sabelman, Eric E.: *See—*
Graham, Thomas E.; and Sabelman, Eric E., 4,481,001, Cl. 434-267.000.
Sachleben, Harold G.; and Rayman, Theodore A., to Allied Corporation. Traverse yarn guide. 4,480,805, Cl. 242-157.00R.
Sackmann, Gunter; Kolb, Gunter; Probst, Joachim; Muller, Friedhelm; and Baumgen, Heinz, to Bayer Aktiengesellschaft. Low-foam surface sizing agents for paper which contain copolymeric maleic anhydride semi-amides. 4,481,319, Cl. 524-213.000.
Safonnikov, Anatoly N.; and Antonov, Anatoly V. Method of electroslag welding of light metals, forming device and flux. 4,481,400, Cl. 219-73.100.
Safonova, Tamara S.: *See—*
Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia F., administrator, 4,481,201, Cl. 424-250.000.
Sagami Chemical Research Center: *See—*
Hiyama, Tamejiro; and Nishide, Kiyoharu, 4,481,366, Cl. 556-431.000.
Sagara, Makoto: *See—*
Takahashi, Katsuji; Fujii, Shigeharu; and Sagara, Makoto, 4,480,366, Cl. 29-26.00A.
St-Pierre, Luc. Stowable trailer. 4,480,851, Cl. 280-656.000.
Saito, Etsuro, to Sony Corporation. Playback apparatus for producing still images. 4,481,543, Cl. 360-10.100.
Saito, Toyokazu; Sanmiya, Seietsu; Hosooka, Akio; Takashima, Kazuo; and Tanaka, Minoru, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Steel Corporation. Configuration detecting device. 4,481,534, Cl. 358-107.000.
Saji, Hideo: *See—*
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,480,614, Cl. 123-339.000.
Sakaguchi, Iwao; and Hayashi, Yoshiaki, to Sumitomo Chemical Company, Limited. Process for producing dioxazine violet pigment. 4,481,358, Cl. 544-99.000.
Sakai, Kazuaki; Sato, Tuneyasu; and Chiba, Kazuhiko, to Kawasaki Kasei Chemicals Ltd. Process for removing anthraquinone type scale. 4,481,073, Cl. 162-30.100.
Sakai, Kiyoshi: *See—*
Hashimoto, Mitsuru; Sakai, Kiyoshi; Fukagai, Toshio; Katoh, Tatsuya, deceased; and Katoh, Mankichi, legal representative, 4,481,271, Cl. 430-57.000.
Sakakibara, Tadamori: *See—*
Okumura, Yoshiharu; Sakakibara, Tadamori; and Kaneko, Katsumi, 4,481,373, Cl. 568-401.000.
Sakakibara, Yasuyuki: *See—*
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,480,619, Cl. 123-446.000.
Sakamoto, Fukuma; and Izumida, Shizuo, to Sumitomo Electric Industries, Inc. Signal receiving circuit for optical communication. 4,481,678, Cl. 455-619.000.
Sakao, Nobuo: *See—*
Kaneta, Hiroshi; Sakao, Nobuo; and Kuraoka, Yasuo, 4,480,682, Cl. 165-14.000.
Sakata, Hajime; Yokono, Kojiro; and Takahashi, Seiichi, to Canon Kabushiki Kaisha. Process for producing solid-state color image pickup array. 4,481,233, Cl. 427-68.000.
Sakuma, Shinzo: *See—*
Kashiwagi, Yoshiyuki; Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,481,390, Cl. 200-144.00B.
Sakurai, Kiyomi; and Arimatsu, Seiji, to Nippon Paint Co., Ltd. Lithographic printing plate. 4,480,549, Cl. 101-456.000.
Sakurai, Masao: *See—*
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,480,443, Cl. 62-227.000.
Salas, Edelmiro A. Dryer for safety razor. 4,480,394, Cl. 34-202.000.

Saleeb, Fouad Z.: *See*—
Hinman, David C.; and Saleeb, Fouad Z., 4,481,223, Cl. 426-422.000.
Sames, S.A.: *See*—
Morel, Jean, 4,481,228, Cl. 427-31.000.
Samodovitz, Arthur J. Process for causing an interface to vibrate and then truncating resulting ringing. 4,480,476, Cl. 73-627.000.
Sanchez, Gilbert A. Base panel retaining baby walker against movement. 4,480,846, Cl. 280-87.02W.
Sand, I. Daniel: *See*—
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,481,238, Cl. 428-35.000.
Sanders, Daniel W.: *See*—
Sanders, Nicholas A.; and Sanders, Daniel W., 4,480,369, Cl. 29-270.000.
Sanders, Nicholas A.; and Sanders, Daniel W. Gripping tool. 4,480,369, Cl. 29-270.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,480,448, Cl. 68-5.00E.
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for wet-heat treating a cloth. 4,480,448, Cl. 68-5.00E.
Sandoz Ltd.: *See*—
Spiegel, Rene ; and Weidmann, Hans, 4,481,206, Cl. 424-267.000.
Sanera Projecting Aktiebolag: *See*—
Oberg, Per O.; and Osterlund, Seth A. O., 4,480,800, Cl. 242-55.000.
Sanken Sangy.. Kabushiki Kaisha: *See*—
Okamoto, Kenji, 4,480,992, Cl. 432-18.000.
Sanmiya, Seietsu: *See*—
Saito, Toyokazu; Sanmiya, Seietsu; Hosooka, Akio; Takashima, Kazuo; and Tanaka, Minoru, 4,481,534, Cl. 358-107.000.
Sannes, Norman: *See*—
Deuman, Gerald J., Sr.; and Sannes, Norman, 4,480,408, Cl. 49-254.000.
Sano, Hideo: *See*—
Togawa, Tsuyoshi; Nakamoto, Teruyuki; Iwata, Mitsuo; Ito, Katuhiko; Sano, Hideo; Sekine, Nobutaka; and Shibuya, Tomoe, 4,480,981, Cl. 425-143.000.
SANOFI: *See*—
Cazaubon, Catherine; Diaz, Joseph; Guegan, Remy; Castro, Bernard; Evin, Genevieve; Corvol, Pierre; and Gagnol, Jean-Pierre, 4,481,192, Cl. 424-177.000.
Sanol Schwarz GmbH: *See*—
Giesselmann, Ewald; and Munch, Ulrich, 4,481,220, Cl. 424-349.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Yoshiaki; and Mori, Atsushi, 4,480,602, Cl. 123-73.0AD.
Sanyo Electric Co., Ltd.: *See*—
Hioki, Toshiaki, 4,481,615, Cl. 369-50.000.
Sapi, Janos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo , 4,481,204, Cl. 424-262.000.
Sargent Industries, Inc.: *See*—
Krieger, Raymond L.; Volna, Steven J.; and Able, Edward T., 4,480,700, Cl. 173-145.000.
Sasagawa, Katsuyoshi: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yokote, Sachio; Sekiguchi, Katsumi; Sasagawa, Katsuyoshi; and Imai, Masao, 4,481,131, Cl. 252-511.000.
Sasage, Yoshihiro: *See*—
Watanabe, Takashi; Sasage, Yoshihiro; and Kato, Hideaki, 4,481,450, Cl. 318-444.000.
Sasaki, Akira; and Davis, William J., to RCA Corporation. Raster-scanned display system for digitally-encoded graphics. 4,481,509, Cl. 340-728.000.
Sasaki, Isao: *See*—
Takigawa, Tadahiro; and Sasaki, Isao, 4,481,042, Cl. 148-1.500.
Sasaki, Yutaka: *See*—
Okamoto, Katsunari; Hosaka, Toshihito; Sasaki, Yutaka; Noda, Juichi; and Edahiro, Takao, 4,480,897, Cl. 350-96.300.
Sasashige, Hiroaki: *See*—
Hirakawa, Tadashi; and Sasashige, Hiroaki, 4,481,066, Cl. 156-472.000.
Satake, Keigo: *See*—
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Sato, Hideo; Nishihara, Motohisa; Yamada, Kazuji; and Suzuki, Seikou, to Hitachi, Ltd. Pressure sensor employing semiconductor strain gauge. 4,480,478, Cl. 73-708.000.
Sato, Ichitaro, to Sony Corporation. Video signal processing circuit. 4,481,547, Cl. 360-33.100.
Sato, Kenji: *See*—
Koshoji, Yoshihiro; and Sato, Kenji, 4,480,817, Cl. 254-332.000.
Sato, Makoto; Miyakawa, Yoshitaka; Fujii, Etsuo; and Matsuda, Shohei, to Honda Giken Kogyo Kabushiki Kaisha. Antilock braking system. 4,480,876, Cl. 303-103.000.
Sato, Mikio; Ogasawara, Asao; and Mori, Keiji, to Aisin Seki Kabushiki Kaisha. Locking apparatus for a detachable sunshade of vehicles. 4,480,404, Cl. 49-62.000.
Sato, Takahisa; Nakanishi, Yoshiyuki; Maruyama, Keizo; and Suzuki, Takehiko, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Catalyst for producing phthalic anhydride. 4,481,304, Cl. 502-209.000.
Sato, Tuneyasu: *See*—
Sakai, Kazuaki; Sato, Tuneyasu; and Chiba, Kazuhiko, 4,481,073, Cl. 162-30.100.
Satoh, Kazuo; and Kawasaki, Katsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Front suspension of light vehicle. 4,480,711, Cl. 180-215.000.
Satomi, Seigo: *See*—
Koga, Shosuke; Koketsu, Mitsuru; Ohta, Yoshihiro; and Satomi, Seigo, 4,481,124, Cl. 252-62.000.
Sattler, Frank A.; and Gorton, William S., Jr., to Westinghouse Electric Corp. UV Curable composition and coil coatings. 4,481,258, Cl. 428-371.000.
Saunders, Ralph R.: *See*—
Frissora Anthony P.; and Saunders, Ralph R., 4,480,390, Cl. 33-286.000.
Savin Corporation: *See*—
Landa, Benzion, 4,480,825, Cl. 271-81.000.
Savoye, Eugene D.: *See*—
Battson, Donald F.; and Savoye, Eugene D., 4,481,538, Cl. 358-213.000.
Savoyet, Jean-Louis P. J.: *See*—
Mole, Alain M.; and Savoyet, Jean-Louis P. J., 4,481,513, Cl. 340-825.310.
Sawada, Tetsuya: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, 4,481,053, Cl. 156-157.000.
Sazaki, Kounin, to Ryobi Ltd. Fishing spinning reels. 4,480,803, Cl. 242-84.20G.
Sbaschnigg, Johann: *See*—
Heissenberger, Otto; Petschauer, Franz; and Sbaschnigg, Johann, 4,481,118, Cl. 210-783.000.
Scapa Inc.: *See*—
Dawes, Donald, 4,481,079, Cl. 162-348.000.
Schaake, Herbert F.; and Tregilgas, John H., to Texas Instruments Incorporated. High-temperature Hg anneal for HgCdTe. 4,481,044, Cl. 148-20.300.
Schaefer, Charles. Adhesive applying apparatus. 4,480,582, Cl. 118-245.000.
Scheffel, Herbert, to South African Inventions Development Corporation. Stabilized railway vehicle. 4,480,553, Cl. 105-167.000.
Scheper, John S.: *See*—
Trinh, Toan; and Scheper, John S., 4,481,126, Cl. 252-174.230.
Scheufler, John H. Cooking apparatus. 4,481,408, Cl. 219-460.000.
Scheurecker, Werner; and Antonitsch, Walter, to Voest-Alpine Aktiengesellschaft. Bow-type continuous casting plant for strands. 4,480,680, Cl. 164-442.000.
Schiessl, Hans; and Leistner, Hermann. Method and apparatus for determining the fill level of containers. 4,481,595, Cl. 364-562.000.
Schijvens, Antonius W. M.: *See*—
Janssen, Jozef T. A.; and Schijvens, Antonius W. M., 4,481,656, Cl. 378-196.000.
Schilling, Curtis L., Jr.: *See*—
Chu, Nan S.; Kanner, Bernard; and Schilling, Curtis L., Jr., 4,481,364, Cl. 556-413.000.
Schipper, Paul H.: *See*—
Krambeck, Frederick J.; Nace, Donald M.; and Schipper, Paul H., 4,481,103, Cl. 208-120.000.
Schlak, Ottfried; Michel, Werner; and Munchenbach, Bernard, to Bayer Aktiengesellschaft. Thermosetting organopolysiloxane mixtures containing platinum catalyst dispersed in solid silicone resin. 4,481,341, Cl. 525-478.000.
Schlechtweg, Ronald E., to United States of America, Air Force. High pressure turbine rotor two-piece blade retainer. 4,480,958, Cl. 416-220.00R.
Schlumberger Technology Corporation: *See*—
Frank, Larry D., 4,480,818, Cl. 254-411.000.
Gianzero, Stanley, 4,481,472, Cl. 324-339.000.
Terral, Ben D., 4,480,687, Cl. 166-117.500.
Schlyter, Fredrik: *See*—
Thompson, Duane T.; Karas, Edwin L.; Root, Ernest F.; and Schlyter, Fredrik, 4,480,914, Cl. 356-346.000.
Schmack, Hans-Jurgen; and Rauth, Erich, to Licentia Patent-Verwaltungs-GmbH. Service integrated digital signal transmission system. 4,481,621, Cl. 370-3.000.
Schmid, Eduard. Cushion for holding an element of grafted skin. 4,480,638, Cl. 128-155.000.
Schmid & Wezel, Firma: *See*—
Elmer, Stefan, 4,480,699, Cl. 173-12.000.
Schmidt, Frederick A.; Verhoeven, John D.; and Gibson, Edwin D., to United States of America, Energy. Tantalum-copper alloy and method for making. 4,481,030, Cl. 75-10.00C.
Schmidt, Hans-Joachim: *See*—
Leupold, Ernst I.; Schmidt, Hans-Joachim; and Popp, Knut, 4,481,146, Cl. 260-410.90R.
Schmidt, Johan M., to U.S. Philips Corp. FM-broadcasting system with transmitter identification by binary phase-modulated, differentially coded code signal. 4,481,658, Cl. 381-14.000.
Schmidt, Manfred; Bottenbruch, Ludwig; and Freitag, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of thermoplastic aromatic polyphosphonates containing small proportions of carbonate structures and product thereof. 4,481,350, Cl. 528-167.000.
Schmidt, Robert: *See*—
Forster, Heinz; Eue, Ludwig; Schmidt, Robert; and Lurssen, Klaus, 4,481,365, Cl. 556-422.000.

Schmitt, Donald J.: *See*—
Anderson, Richard M.; Snider, Harold F.; and Schmitt, Donald J., 4,481,494, Cl. 337-95.000.

Schmoyer, Arthur R. System and method for instruction in the operation of a keyboard musical instrument. 4,480,521, Cl. 84-1.280.

Schnabel Foundation Company: *See*—
Schnabel, Harry, Jr., 4,480,945, Cl. 405-262.000.

Schnabel, Harry, Jr., to Schnabel Foundation Company. Method of reinforcing an existing earth supporting wall. 4,480,945, Cl. 405-262.000.

Schneider, Fritz N. Beverage container opening means. 4,480,763, Cl. 220-269.000.

Schneider, Klaus. Toe holder for safety ski bindings. 4,480,850, Cl. 280-630.000.

Schneider, Mitchell. Safety collar device. 4,480,589, Cl. 119-106.000.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Chu, John Y.; and Kabakoff, Bruce D., 4,481,198, Cl. 424-236.000.

Schnyder, Eugen, to Sulzer-Escher Wyss Limited. Rolling mill. 4,480,452, Cl. 72-16.000.

Schoch, Robert, to Weinmann GmbH & Co. KG; and Fahrrad-und Motorrad-Teilefabrik Im Haselbusch. Closure for shoes, especially ski boots. 4,480,395, Cl. 36-50.000.

Schoenung, Bernhard: *See*—
Glock, Alfred; Seebo, Kurt; Schoenung, Bernhard; and Tkotz, Dieter, 4,480,354, Cl. 19-0.250.

Schonberger, Milton. Tamper visible indicator for container lid. 4,480,760, Cl. 215-230.000.

Schondelmayer, Jurgen: *See*—
Behrens, Rainer; Peinsl, Dieter; Schondelmayer, Jurgen; and Brach, Ulrich, 4,480,759, Cl. 215-220.000.

Schoonejongen, Ronald J.: *See*—
Johnson, Gary W.; Schoonejongen, Ronald J.; and Hilson, David G., II, 4,481,261, Cl. 428-434.000.

Schopper, Alf: *See*—
Vignos, Louis; and Schopper, Alf, 4,480,355, Cl. 19-236.000.

Schubert, Steven K.: *See*—
Tscheulin, Fred L.; Tilley, Donald R.; Schubert, Steven K.; and Skyllingstad, William G., 4,481,512, Cl. 340-825.250.

Schue, Francois: *See*—
Dubois, Jean C.; Gazard, Macyse; Schue, Francois; Giral, Louis; Rolland, Michel; and Aldissi, Mahmoud, 4,481,132, Cl. 252-519.000.

Schukei, Glen E.; Formanek, Frank J.; and Graf, Donald V., to Combustion Engineering, Inc. Apparatus and method for sealing a tube joint. 4,480,841, Cl. 277-1.000.

Schuler, Murry W.: *See*—
Alm, Arthur L., 4,480,643, Cl. 130-24.000.

Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., to Wheelabrator-Frye Inc. Bladed centrifugal blasting wheel. 4,480,413, Cl. 51-435.000.

Schulz, Donald N.: *See*—
Newlove, John C.; Portnoy, Robert C.; Schulz, Donald N.; and Kitano, Kisuho, 4,480,693, Cl. 166-293.000.

Schulze-Berge, Carl J.; and Kohl, Vance L., to Manitowoc Company, Inc., The. Ice maker harvest control. 4,480,441, Cl. 62-138.000.

Schulze, Werner, to Alfred Karcher GmbH & Co. Motor-driven pump unit for a high-pressure cleaning apparatus. 4,480,967, Cl. 417-368.000.

Schumacher, Gerd; and Masurat, Heinz-Werner, to B.A.T. Cigaretten-Fabriken GmbH. Process for determining the resistance to draw and the gas permeability of a test piece and a device for carrying out such a process. 4,480,463, Cl. 73-38.000.

Schwartz, Irwin S.: *See*—
Rubin, David, 4,481,195, Cl. 424-180.000.

Schweikert, Karl: *See*—
Horrwarth, Ernst; Schweikert, Karl; and Weckerle, Hans J., 4,480,380, Cl. 29-736.000.

Schwimmer, Adolf: *See*—
Rubin, David, 4,481,195, Cl. 424-180.000.

Scott, Bentley N.: *See*—
Brehm, Gailon E.; and Scott, Bentley N., 4,481,487, Cl. 331-117.00D.

Scott, David R.; and Rhoades, Thomas S., to Scott Science & Technology, Inc. System for assessing the integrity of structural systems. 4,480,480, Cl. 73-769.000.

Scott, John W.: *See*—
Ball, John A.; and Scott, John W., 4,481,083, Cl. 204-38.00A.

Scott Science & Technology, Inc.: *See*—
Scott, David R.; and Rhoades, Thomas S., 4,480,480, Cl. 73-769.000.

Scott, Wallace A., II. Sound level alarm which ignores transient sounds. 4,481,504, Cl. 340-573.000.

Sea-Labs, Inc.: *See*—
Nelson, Richard H.; Christensen, Ray G.; and Stedman, David, 4,480,986, Cl. 431-37.000.

Secalt, S.A.: *See*—
Gortan, Guido, 4,480,816, Cl. 254-264.000.

Security Tag Systems, Inc.: *See*—
Charlot, Lincoln H., Jr., 4,481,428, Cl. 307-219.100.

Sedlacek, Robert S., to Lab Products, Inc. Animal cage assembly with reusable filter cap. 4,480,587, Cl. 119-15.000.

Seebo, Kurt: *See*—
Glock, Alfred; Seebo, Kurt; Schoenung, Bernhard; and Tkotz, Dieter, 4,480,354, Cl. 19-0.250.

Segura, Dionisio T. Napping apparatus for textile material. 4,480,363, Cl. 26-29.00R.

Seip, Detlev: *See*—
Harreus, Albrecht; Kaiser, Eduard; Seip, Detlev; and Zimmermann, Wolfgang, 4,481,328, Cl. 524-493.000.

Sekiguchi, Katsumi: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yokote, Sachio; Sekiguchi, Katsumi; Sasagawa, Katsuyoshi; and Imai, Masao, 4,481,131, Cl. 252-511.000.

Sekine, Nobutaka: *See*—
Togawa, Tsuyoshi; Nakamoto, Teruyuki; Iwata, Mitsuo; Ito, Katuhiko; Sano, Hideo; Sekine, Nobutaka; and Shibuya, Tomoe, 4,480,981, Cl. 425-143.000.

Seldon, Philip. Bottle sealing apparatus and method. 4,480,424, Cl. 53-489.000.

Sella, Nancy W.: *See*—
Hawkins, Jeanette C.; Sella, Nancy W.; and Bradford, Carl D., 4,480,346, Cl. 5-490.000.
Hawkins, Jeanette C.; Sella, Nancy W.; and Bradford, Carl D., 4,480,347, Cl. 5-490.000.

Sellberg, Ronald P.: *See*—
Brodeur, Rene H.; Terlecky, Boris S.; Sellberg, Ronald P.; and Halliar, William R., 4,480,554, Cl. 105-171.000.

Semada, Alsthom-Atlantique: *See*—
Guiriec, Gerard, 4,480,993, Cl. 432-266.000.

Semenikhina, Valentina G.: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.

Senco Products, Inc.: *See*—
Becht, Carl T., 4,480,640, Cl. 128-325.000.

Serini, Volker; Nouvertne, Werner; and Freitag, Dieter, to Bayer Aktiengesellschaft. Flame-resistant polymer mixtures. 4,481,338, Cl. 525-394.000.

Sexstone, John H.; Finn, Everett N.; Lowe, Byron L.; and Milliner, Ken M., to Brown & Williamson Tobacco Corporation. Apparatus for making grooves in cigarette filters. 4,480,982, Cl. 425-385.000.

SFS Stadler AG: *See*—
Regensburger, Werner, 4,480,951, Cl. 408-224.000.

Shacket, Sheldon; and Helfman, Robert, to Trus-Us, Inc. Dormer structure and method. 4,480,420, Cl. 52-745.000.

Shafer, James E.; and Ford, Earl M., to Cessna Aircraft Company, The. Double acting railway car stabilizing cylinder. 4,480,555, Cl. 105-199.00R.

Shaffer, David C.: *See*—
Kasun, Michael J.; and Shaffer, David C., 4,480,936, Cl. 400-207.000.

Shank, William E.; and Bercaw, Kenneth K., to Litton Industrial Products, Inc. In-process grinding gage. 4,480,412, Cl. 51-165.00R.

Shannon, James E., to Nalco Chemical Company. Feeder filter bag for bypass feeders. 4,481,110, Cl. 210-199.000.

Shapiro, Jeffrey H.: *See*—
Warde, Cardinal; and Shapiro, Jeffrey H., 4,481,531, Cl. 358-60.000.

Shardakova, Emilia F., administrator: *See*—
Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia F., administrator, 4,481,201, Cl. 424-250.000.

Sharp, Harper E.; and Smither, Miles A., to Wilson Industries, Inc. Borehole survey instrument control circuitry. 4,480,391, Cl. 33-314.000.

Sharp Kabushiki Kaisha: *See*—
Kamei, Fumio; and Yanagiuchi, Shigenobu, 4,481,508, Cl. 340-712.000.
Matsubayashi, Kazuyuki; and Tateda, Koichi, 4,481,396, Cl. 219-10.55B.
Tanabe, Takeshi, 4,481,394, Cl. 219-10.55B.

Sharp Kabushiki Kisha: *See*—
Anzai, Shunju; Ibuchi, Yoshiaki; and Taniguchi, Akihiko, 4,480,908, Cl. 355-14.0FU.

Shaw, Hugh E., Jr., to PPG Industries, Inc. Float glass ribbon monitor enhancement method and apparatus. 4,480,917, Cl. 356-364.000.

Shaw, Ray H. Retainer device for auger, roof and the like type bits. 4,480,874, Cl. 299-91.000.

Shell Oil Company: *See*—
Ayers, Ray R., 4,480,858, Cl. 285-114.000.
Burrage, Eric C., 4,481,611, Cl. 367-19.000.
Downs, John D., 4,481,294, Cl. 435-259.000.

Shepard, Dennis D. Intraocular lens with resilient support means. 4,480,340, Cl. 3-13.000.

Shepard, Thomas C.: *See*—
Heimer, Robbin; Shepard, Thomas C.; and Lucier, Peter F., 4,480,410, Cl. 51-5.00D.

Shepherd, Freddie A.: *See*—
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,481,238, Cl. 428-35.000.

Sherman, Dudley M.: *See*—
Kolpe, Vasant V.; Sherman, Dudley M.; Hendrickson, William A.; and Chou, Hsin-hsin, 4,481,234, Cl. 427-71.000.

Sherman, Richard H.: *See*—
Gable, Melvin G.; and Sherman, Richard H., 4,481,641, Cl. 375-7.000.

Shibayama, Tooru; and Kajiya, Hiroshi, to Kabushiki Kaisha Sato. Guiding device for printing paper strip in a nonimpact printer. 4,480,933, Cl. 400-120.000.
Shibuya, Tomoe: *See*—
Togawa, Tsuyoshi; Nakamoto, Teruyuki; Iwata, Mitsuo; Ito, Katuhiko; Sano, Hideo; Sekine, Nobutaka; and Shibuya, Tomoe, 4,480,981, Cl. 425-143.000.
Shida, Mitsuzo; Zeitlin, Robert; Machonis, John, Jr.; and Adur, Ashok M., to Chemplex Company. Composite structures. 4,481,262, Cl. 428-441.000.
Shida, Takafumi: *See*—
Aoki, Katsumichi; Kanda, Yoichi; Shida, Takafumi; Satake, Keigo; and Shinkawa, Hiroyasu, 4,481,027, Cl. 71-90.000.
Shigeru, Muramatsu: *See*—
Hiroshi, Niimi; Meiji, Anahara; and Shigeru, Muramatsu, 4,480,434, Cl. 57-333.000.
Shim, Gregory. Stereo apparatus for VTR with monoral audio head. 4,481,545, Cl. 360-18.000.
Shimadzu Corporation: *See*—
Takeda, Tsunezo; and Miseki, Kozo, 4,481,415, Cl. 250-292.000.
Shimamune, Takayuki: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Hirao, Kazuhiro; and Hirayama, Ryuta, 4,481,097, Cl. 204-290.00F.
Shimano Industrial Company Limited: *See*—
Shimano, Keizo; and Shimano Industrial Company Limited, 4,480,720, Cl. 188-24.150.
Shimano, Keizo; and Shimano Industrial Company Limited. Brake operating device for a bicycle. 4,480,720, Cl. 188-24.150.
Shimazaki, Norihiko: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,481,196, Cl. 424-180.000.
Shimoda, Ikuo: *See*—
Izeki, Jiro; and Shimoda, Ikuo, 4,480,731, Cl. 188-381.000.
Shin-Etsu Chemical Co.: *See*—
Obata, Hiroyuki; Takamizawa, Minoru; and Inoue, Yoshio, 4,481,282, Cl. 430-303.000.
Shinkawa, Hiroyasu: *See*—
Aoki, Katsumichi; Kanda, Yoichi; Shida, Takafumi; Satake, Keigo; and Shinkawa, Hiroyasu, 4,481,027, Cl. 71-90.000.
Shinozaki, Takashi: *See*—
Inoue, Kazuo; Matsuda, Minoru; and Shinozaki, Takashi, 4,480,712, Cl. 180-219.000.
Shiojiri, Hiroyuki: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,481,217, Cl. 424-311.000.
Shirai, Tatsunori: *See*—
Osaka, Fukunobu; and Shirai, Tatsunori, 4,481,523, Cl. 357-30.000.
Shiroyama, Tadayoshi. Trigger valve for pneumatic nailing machine. 4,480,528, Cl. 91-461.000.
Shoch, John F.: *See*—
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Shultz, Richard E.; and Voecks, William F., Jr., to Burroughs Corporation. Pivotal feed head for printing apparatus. 4,480,827, Cl. 271-111.000.
Shumikhin, Vladimir S.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Shumikhin, Vladimir S.; Kucherenko, Sergei V.; Zhelnis, Mechislav V.; and Zemlyavichus, Pranas V., 4,480,820, Cl. 266-44.000.
Shumiyashu, Noriaki, to TDK Corporation. Magnetic elastic lumbar belt. 4,480,596, Cl. 128-1.300.
Shurley, Jane E., heiress: *See*—
Ward, Jarrel D.; Turner, Richard E., deceased; Turner, Betty L., heiress; Blais, Christina G., heiress; Turner, Terry L., heiress; and Shurley, Jane E., heiress, 4,480,791, Cl. 239-533.150.
Sicko, John S.: *See*—
Zach, Franz C.; Bose, Bimal K.; Espelage, Paul M.; and Sicko, John S., 4,481,457, Cl. 318-803.000.
Sico Incorporated: *See*—
Wilson, Kermit H.; and Carlson, Ronald R., 4,480,556, Cl. 108-48.000.
Sidhu, Jasbir: *See*—
Bailey, Joseph; Clarke, David; Crawley, Michael W.; Marsden, Peter D.; and Sidhu, Jasbir, 4,481,268, Cl. 430-17.000.
Siebert, Hans W.: *See*—
Legerius, Bengt E.; and Siebert, Hans W., 4,480,717, Cl. 184-14.000.
Siegfried, Pauluhn: *See*—
von Bebenburg, Walter, deceased; and Siegfried, Pauluhn, 4,481,205, Cl. 424-263.000.
Siemens Aktiengesellschaft: *See*—
Andrascek, Ernst; Hadersbeck, Hans; and Wallenhorst, Friedhelm, 4,481,035, Cl. 106-1.230.
Foell, Helmut; Freienstein, Bernhard; Geim, Karl; Grabmaier, Josef; and Hintringer, Otmar, 4,481,235, Cl. 427-74.000.
Gehring, Gerhard, 4,481,479, Cl. 330-265.000.
Haendle, Joerg, 4,481,651, Cl. 378-22.000.
Haeusler, Jochen, 4,480,739, Cl. 198-381.000.
Heinle, Georg, 4,481,601, Cl. 364-815.000.
Kobler, Ulrich; and Wanka, Eberhard, 4,481,493, Cl. 335-179.000.
Kroning, Armin; Kerscher, Max; and Krummel, Peter, 4,481,460, Cl. 323-266.000.
Larsson, Sten, 4,481,657, Cl. 378-209.000.
Muller, Jorg, 4,481,041, Cl. 148-1.500.
Siemens-Allis, Inc.: *See*—
Clement, Ralph C.; Parmenter, Charles W.; and Lockwood, William T., 4,481,391, Cl. 200-163.000.
Worrix, Matthew L., 4,481,387, Cl. 200-48.00R.
Siemens Gammasonics, Inc.: *See*—
Persyk, Dennis E., 4,481,419, Cl. 250-363.00S.
Siewert, Robert M., to General Motors Corporation. Catalytic late direct injection spark ignition engine. 4,480,613, Cl. 123-298.000.
Silfversparre, Bengt R. Pivotable rigid line for linking sailor to boom of surfboard sailboat. 4,480,567, Cl. 114-39.000.
Silva, Wayne A. Sleep switch volume control. 4,481,674, Cl. 455-231.000.
Silver Seiko, Ltd.: *See*—
Kamikura, Shigeo; and Itoh, Takeshi, 4,480,931, Cl. 400-63.000.
Simmonds, Robert C., Jr.; Gilbride, Andrew J.; and Martin, John F., to USM Corporation. Deposition apparatus. 4,480,581, Cl. 118-50.000.
Simpson Strong-Tie Company, Inc.: *See*—
Gilb, Tyrell T.; and Commins, Alfred D., 4,480,941, Cl. 403-232.100.
Simpson, Thomas W., to Solaronics, Inc. Fuel efficient oven. 4,480,628, Cl. 126-21.00A.
Singer Company, The: *See*—
Lukawich, Joseph J.; and Adams, Kenneth D., 4,480,566, Cl. 112-321.000.
Ponte, Gary W., 4,480,564, Cl. 112-237.000.
Sinha, Brajnandan. Apparatus for measuring and indicating the fluid level in vessels. 4,480,468, Cl. 73-290.00V.
Siplast, S.A.: *See*—
Meynard, Jean-Yves, 4,481,245, Cl. 428-192.000.
Site-Lite, Inc.: *See*—
Lanning, Charles T., 4,481,561, Cl. 362-111.000.
Skatsche, Othmar; and Feichtinger, Gerhard, to Avl Gesellschaft Fur Verbrennungskraftmaschinen Und Messtechnik m.b.H.; and Prof.Dr.Dr.h.c. Hans List. Water-cooled two-stroke internal combustion engine. 4,480,601, Cl. 123-59.00B.
SKF Kugellagerfabriken GmbH: *See*—
Glock, Alfred; Seebo, Kurt; Schoenung, Bernhard; and Tkotz, Dieter, 4,480,354, Cl. 19-0.250.
Winkler, Ottmar; and Pfaller, Egon, 4,480,529, Cl. 92-31.000.
SKF Kugellagerfavriken GmbH: *See*—
Reith, Walter; and Walter, Lothar, 4,480,879, Cl. 308-6.00C.
SKF Steel Engineering AB: *See*—
Eriksson, Sune, 4,481,031, Cl. 75-10.00R.
Skidmore, F. Oren. Tire cooling structure. 4,480,669, Cl. 152-153.000.
Skinner, Timothy J., to General Motors Corporation. Refrigerant compressor lubrication system. 4,480,964, Cl. 417-222.000.
Skutecki, Edmund R., to Sperry Corporation. Adaptive washout circuit for use in a stability augmentation system. 4,481,586, Cl. 364-434.000.
Skyllingstad, William G.: *See*—
Tscheulin, Fred L.; Tilley, Donald R.; Schubert, Steven K.; and Skyllingstad, William G., 4,481,512, Cl. 340-825.250.
Slavik, William H.: *See*—
McGowan, Michael J.; Slavik, William H.; and Cash, Carson D., III, 4,481,589, Cl. 364-474.000.
Sleeth, Robert S.; and Monticelli, Dennis M., to National Semiconductor Corporation. Buffer inverter circuit with adaptive bias. 4,481,481, Cl. 330-296.000.
Sleffel, William M.: *See*—
Lehman, F. Allen; Sleffel, William M.; and Ray, Malcolm G., 4,481,503, Cl. 340-518.000.
Sloan, Craig, to Grain Systems, Inc. Grain bin roof vent. 4,480,534, Cl. 98-55.000.
Slocombe, Brian: *See*—
Sutherland, Robert; and Slocombe, Brian, 4,481,210, Cl. 424-271.000.
Slongo, Mario: *See*—
Rody, Jean; and Slongo, Mario, 4,481,315, Cl. 524-89.000.
Slumberger Technology Corporation: *See*—
Goldaniga Rene F.; Walter, Geard; Walter G. W.; Glotin, Bernard J. P.; and Gallois, Daniel, 4,480,697, Cl. 166-372.000.
Smallenberg, Willem A. L.: *See*—
de Koning, Stephanus H.; and Smallenberg, Willem A. L., 4,481,660, Cl. 381-58.000.
Smith, Charles M.; Penn, Robert W.; and Pangborn, George W. Restrictive insert for microwave ovens. 4,481,395, Cl. 219-10.55E.
Smith International, Inc.: *See*—
Garrett, William R., 4,480,703, Cl. 175-195.000.
May, James R.; and Black, Billy E., 4,480,704, Cl. 175-228.000.
Smith, James G.; and Ojstrsek, Lawrence J. Crossbow carrying case. 4,480,774, Cl. 224-205.000.
Smith, Peter H., to General Electric Company. Method and apparatus for limiting the evaporation rate of liquids heated by cooking appliance surface units. 4,481,409, Cl. 219-518.000.
Smith, Stanley, to Rolls-Royce Limited. Self priming gear pump. 4,480,970, Cl. 418-15.000.
Smith, William W., to Octopus Systems, Inc. Apparatus for converting the surface motion of a liquid body into usable power. 4,480,966, Cl. 417-332.000.
Smither, Miles A.: *See*—
Sharp, Harper E.; and Smither, Miles A., 4,480,391, Cl. 33-314.000.
SmithKline Beckman Corporation: *See*—
Ali, Fadia E.; and Huffman, William F., 4,481,193, Cl. 424-177.000.
Ali, Fadia E.; and Huffman, William F., 4,481,194, Cl. 424-177.000.
Smolinsky, Gerald: *See*—
Reichmanis, Elsa; and Smolinsky, Gerald, 4,481,049, Cl. 156-643.000.
SMS Schloemann-Siemag AG: *See*—
Svagr, Alexander, 4,480,454, Cl. 72-78.000.

Smulders, Auguste: *See*—
Durand, Francois; and Smulders, Auguste, 4,480,491, Cl. 74-411.000.
Snamprogetti S.p.A.: *See*—
di Pietro, Raffaele; Paggini, Alberto; and Lagana', Vincenzo, 4,481,012, Cl. 44-53.000.
Ginatta, Marco, 4,481,098, Cl. 204-297.00W.
Snider, Harold F.: *See*—
Anderson, Richard M.; Snider, Harold F.; and Schmitt, Donald J., 4,481,494, Cl. 337-95.000.
Snyder, Edward A.; and Teter, Michael P., to Corning Glass Works. Automotive headlight having optics in the reflector. 4,481,563, Cl. 362-256.000.
Snyder, John D., Jr., to Sundstrand Data Control, Inc. Transducer alignment method for weight and balance system. 4,480,912, Cl. 356-138.000.
Societa Cavi Pirelli S.p.A.: *See*—
Vecellio, Bernardino, 4,481,259, Cl. 428-377.000.
Societe Anonyme D.B.A.: *See*—
Carre, Jean-Jacques, 4,480,526, Cl. 91-374.000.
Societe Anonyme Dite: Aubert & Duval: *See*—
Faure, Andre , 4,481,264, Cl. 428-627.000.
Societe Anonyme dite: L'Oreal: *See*—
Grollier, Jean-Francois; and Boudy, Francoise, 4,481,185, Cl. 424-59.000.
Societe Anonyme Engrenages et Reducteurs: *See*—
Durand, Francois; and Smulders, Auguste, 4,480,491, Cl. 74-411.000.
S.A. Etablissements SARASIN et Cie: *See*—
Bayart, Martin; Grincourt, Bernard; and Chabierski, Rene , 4,480,660, Cl. 137-478.000.
S.A. Tervo Oy Karjalan Rautarakenne: *See*—
Vaittinen, Jorma; and Kononen, Seppo, 4,480,667, Cl. 144-373.000.
Societe d'Etudes de Machines Thermiques S.E.M.T.: *See*—
Renaud, Patrick; and Bourget, Jean-Paul, 4,480,792, Cl. 239-533.600.
Societe Francaise Hoechst: *See*—
Cabestany, Jean; and Trouve, Claude, 4,481,116, Cl. 210-735.000.
Christidis, Yani; and Vallejos, Jean-Claude, 4,481,374, Cl. 568-432.000.
Societe Industrielle Lorientaise (S.I.L.): *See*—
Guiriec, Gerard, 4,480,993, Cl. 432-266.000.
Sofiyanski, Vassil M.: *See*—
Vassilev, Vassil B.; Sofiyanski, Vassil M.; Vassilev, Boris V.; Danchev, Panayot Y.; Angelov, Angel B.; Strandjaliev, Yordan M.; and Kehayov, Georgi S., 4,481,482, Cl. 330-297.000.
Solaronics, Inc.: *See*—
Simpson, Thomas W., 4,480,628, Cl. 126-21.00A.
Solomon, Victor J. Insulation assembly. 4,480,676, Cl. 160-272.000.
Solvay & Cie (Societe Anonyme): *See*—
Georlette, Pierre; and Maquet, Nestor, 4,481,158, Cl. 264-22.000.
Somemiya, Akiyoshi; Miyashita, Shunichu; and Ishizu, Junichi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Heat resistant polyphenylene ether composition. 4,481,332, Cl. 525-132.000.
Sonenstein, Gerard G., to Colgate Palmolive Company. Water soluble films of polyvinyl alcohol polyvinyl pyrrolidone. 4,481,326, Cl. 524-377.000.
Sonoco Products Company: *See*—
Dancy, H. Gordon, 4,480,750, Cl. 206-554.000.
Sony Corporation: *See*—
Fujimori, Tohru, 4,480,881, Cl. 308-189.00A.
Saito, Etsuro, 4,481,543, Cl. 360-10.100.
Sato, Ichitaro, 4,481,547, Cl. 360-33.100.
Tanaka, Sadaaki, 4,481,537, Cl. 358-162.000.
Sosnowski, Thomas P.: *See*—
Baranyai, Lawrence; Colton, John R.; Lane, Michael S.; and Sosnowski, Thomas P., 4,481,624, Cl. 370-62.000.
Soubry, Garry V.; and MacFarlane, James L. High rise escape device. 4,480,716, Cl. 182-233.000.
South African Inventions Development Corporation: *See*—
Scheffel, Herbert, 4,480,553, Cl. 105-167.000.
Southworth, Richard A.: *See*—
Polk, Darryl R.; and Southworth, Richard A., 4,480,938, Cl. 400-322.000.
Spector, Abner. Effects box system and method. 4,481,661, Cl. 381-61.000.
Sperry Corporation: *See*—
Chase, Karl L., 4,481,605, Cl. 364-719.000.
Martin, Richard J.; Bondurant, David W.; and Nelson, Leslie W., 4,481,580, Cl. 364-200.000.
Skutecki, Edmund R., 4,481,586, Cl. 364-434.000.
Spiegel, Rene ; and Weidmann, Hans, to Sandoz Ltd. Use of a spiro succinimide derivative in the treatment of dementia of the Alzheimer type. 4,481,206, Cl. 424-267.000.
Splithoff, Theodor, to Ulrich Mobius. Roof wind deflector with mounting support. 4,480,869, Cl. 296-217.000.
Spongh, Rolf T., to Nordson Corporation. Method and apparatus for modifying a prerecorded sequence of ON/OFF commands for controlling a bistable device operating in conjunction with a moving robot under program control. 4,481,591, Cl. 364-513.000.
Sprague Electric Company: *See*—
Ball, John A.; and Scott, John W., 4,481,083, Cl. 204-38.00A.
Chen, Chia-Tien; and Hutchins, Gudrun, 4,481,084, Cl. 204-42.000.
Sprague, Robert A., to Xerox Corporation. Two dimensional electro-optic modulator and applications therefor. 4,480,899, Cl. 350-356.000.
Spranger, Paul B., to Altec Corporation. Network for use with piezoceramic transducer. 4,481,663, Cl. 381-98.000.
Sprangle, Phillip: *See*—
Kapetanakos, Christos A.; and Sprangle, Phillip, 4,481,475, Cl. 328-237.000.
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., to International Flavors & Fragrances Inc. Use of cyclohexenyl-alkyl acrolein derivatives in augmenting or enhancing the aroma or taste of smoking tobacco compositions and smoking tobacco articles. 4,480,647, Cl. 131-276.000.
Sprecker, Mark A., to International Flavors & Fragrances Inc. Use of norbornyl esters in augmenting or enhancing the aroma or taste or smoking tobacco compositions and smoking tobacco articles. 4,480,648, Cl. 131-276.000.
Springer, Virgil E., to Regal International, Inc. Polymeric annular snubbing apparatus. 4,480,843, Cl. 277-31.000.
Spruzh, Yazep Y.: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.
Spurlin, Stephen F.: *See*—
Bailey, Keith A.; and Spurlin, Stephen F., 4,480,728, Cl. 188-271.000.
Square D Company: *See*—
Bush, Austin L.; Apperson, Kenneth P.; and Todd, Jerald C., 4,480,460, Cl. 72-410.000.
Staar S. A.: *See*—
d'Alayer de Costemore d'Arc, Stephane M., 4,480,387, Cl. 30-41.000.
Staat, Karlhans: *See*—
Zacharias, Theodor; Gerhards, Hans D.; and Staat, Karlhans, 4,480,515, Cl. 83-81.000.
Stafsudd, Oscar M., Jr.: *See*—
Grossman, Jonathan G.; Casperson, Lee W.; and Stafsudd, Oscar M., Jr., 4,481,634, Cl. 372-87.000.
Staggs, Kevin P.; Clarke, Charles J., Jr.; and Huntington, James C., to Honeywell Information Systems Inc. Method and apparatus for filling polygons displayed by a raster graphic system. 4,481,594, Cl. 364-521.000.
Standard Oil Company, The: *See*—
Curatolo, Benedict S.; and Coffey, Gerald P., 4,481,354, Cl. 528-487.000.
Stanford, Lamarr O. Front pack. 4,480,775, Cl. 224-210.000.
Stannard, John W.: *See*—
DeFino, John M.; Coomer, Rufus; Stannard, John W.; and Voget, Gary G., 4,481,574, Cl. 364-200.000.
Stanton, Thomas J.: *See*—
Judkins, Thomas E.; and Stanton, Thomas J., 4,480,416, Cl. 52-376.000.
Stapp, Paul R., to Phillips Petroleum Company. Phosphorus containing ester cosurfactants in enhanced oil recovery processes. 4,480,692, Cl. 166-273.000.
Stark, Fred J., Jr. Rubber compositions and method. 4,481,335, Cl. 525-261.000.
Stauffer Chemical Company: *See*—
Dodson, David L.; Pate, Bruce D.; and Rogers, Philip C., 4,481,176, Cl. 423-322.000.
Prisbylla, Michael P., 4,481,026, Cl. 71-86.000.
Steck Manufacturing Co., Inc.: *See*—
Steck, Mark A., 4,481,059, Cl. 156-254.000.
Steck, Mark A., to Steck Manufacturing Co., Inc. Window panel removal method. 4,481,059, Cl. 156-254.000.
Stedman, David: *See*—
Nelson, Richard H.; Christensen, Ray G.; and Stedman, David, 4,480,986, Cl. 431-37.000.
Steelweld France: *See*—
Humblot, Bernard, 4,481,401, Cl. 219-91.200.
Steeves, Arthur F.; and Bibb, Albert E., to United States of America, Energy. Heat treatment of NiCrFe alloy to optimize resistance to intergrannular stress corrosion. 4,481,043, Cl. 148-20.300.
Steinle, Benedikt: *See*—
Meisser, Claudio; Lechner, Hubert; and Steinle, Benedikt, 4,480,486, Cl. 73-861.280.
Stencel Aero Engineering Corporation: *See*—
Duncan, James W., 4,480,806, Cl. 244-122.00A.
Stephens, Geoffrey B.: *See*—
Hoffman, Charles R.; and Stephens, Geoffrey B., 4,481,566, Cl. 363-60.000.
Stephens, James B.: *See*—
Miller, Charles G.; and Stephens, James B., 4,480,894, Cl. 350-167.000.
Sterling, Robert E., to Medical Research Associates, Ltd. #2. Hydrocarbon block copolymer with dispersed polysiloxane. 4,481,323, Cl. 524-269.000.
Stewart, Myron C.: *See*—
Taylor, Byron K.; and Stewart, Myron C., 4,481,614, Cl. 369-43.000.
Stewart, Orvel L. Solar heat treating of well fluids. 4,481,109, Cl. 210-149.000.
Stewen, Wilhelm: *See*—
Weskamp, Wilhelm; and Stewen, Wilhelm, 4,481,011, Cl. 44-51.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Valev, Assen, 4,480,608, Cl. 123-195.00C.

Stinson, Joseph B., to Joseph B. Stinson Co. Remote oil level indicator. 4,480,610, Cl. 123-196.00S.

Stinton, David P.: *See*—
Angelini, Peter; Caputo, Anthony J.; Hutchens, Richard E.; Lackey, Walter J.; and Stinton, David P., 4,481,134, Cl. 252-628.000.

Stodieck, Robert W.: *See*—
McTavish, Mary S.; Stodieck, Robert W.; and Doljack, Frank A., 4,481,498, Cl. 338-20.000.

Stokes (Australasia) Limited: *See*—
Stokes, Paul W.; Doody, Brian C.; and Lill, Harold K., 4,481,407, Cl. 219-457.000.

Stokes, Paul W.; Doody, Brian C.; and Lill, Harold K., to Stokes (Australasia) Limited. Electric hotplate. 4,481,407, Cl. 219-457.000.

Stokes, Vijay K., to General Electric Company. Inverted molded commutators. 4,481,439, Cl. 310-233.000.

Stone, David E.: *See*—
Ioannidis, Kostas P.; and Stone, David E., 4,481,541, Cl. 358-244.000.

Stone, Rex D., to Motter Printing Press Co. Webbing system. 4,480,801, Cl. 242-56.00R.

Stopinc AG: *See*—
Meier, Ernst, 4,480,771, Cl. 222-598.000.

Storset, Magnar K.: *See*—
Halsor, Svein R.; and Storset, Magnar K., 4,480,928, Cl. 374-5.000.

Stoy, George P.: *See*—
Stoy, Vladimir A.; and Stoy, George P., 4,480,642, Cl. 128-341.000.

Stoy, Vladimir A.; and Stoy, George P., to Health Products Research, Inc. Dilation device for the cervix. 4,480,642, Cl. 128-341.000.

Strachle, Wolfgang; Buethe, Ingolf; and Marx, Matthias, to BASF Aktiengesellschaft. Process for the preparation of cellular and non-cellular polyurethanes. 4,481,309, Cl. 521-172.000.

Strandjaliev, Yordan M.: *See*—
Vassilev, Vassil B.; Sofiyanski, Vassil M.; Vassilev, Boris V.; Danchev, Panayot Y.; Angelov, Angel B.; Strandjaliev, Yordan M.; and Kehayov, Georgi S., 4,481,482, Cl. 330-297.000.

Streib, Stephen F., to Chevron Research Company. Ultrasensitive apparatus and method for detecting change in fluid flow conditions in a flowline of a producing oil well, or the like. 4,480,960, Cl. 417-12.000.

Streng, Erich: *See*—
Herbrich, Horst; Kuchler, Rainer; and Streng, Erich, 4,481,632, Cl. 372-58.000.

Stroud, Stephen G.: *See*—
King, Patrick F.; and Stroud, Stephen G., 4,481,278, Cl. 430-225.000.
King, Patrick F.; and Stroud, Stephen G., 4,481,286, Cl. 430-441.000.

Stupp, Edward H.; and Fellows, Mark W., to U.S. Philips Corporation. Power supply for a magnetron. 4,481,447, Cl. 315-101.000.

Suefuji, Masahiro: *See*—
Misaki, Susumu; Suefuji, Masahiro; Mitote, Tamio; and Matsumura, Naotake, 4,481,149, Cl. 260-465.00D.

Sugata, Takashi: *See*—
Yabuta, Takenobu; and Sugata, Takashi, 4,480,714, Cl. 180-290.000.

Sugaya, Takao: *See*—
Takiguchi, Michitaka; and Sugaya, Takao, 4,481,507, Cl. 340-679.000.

Sugie, Kiyoshi: *See*—
Fujiwara, Kazuo; Sugie, Kiyoshi; and Uetani, Fujiko, 4,481,033, Cl. 75-128.00A.

Sugimoto, Osamu; Ishizaka, Shinobu; Tanaka, Youji; and Suzuki, Noboru. Method of starting variable-speed induction motor. 4,481,455, Cl. 318-778.000.

Sugimoto, Tadao: *See*—
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, 4,481,285, Cl. 430-410.000.

Sullivan, Robert P.; and Jackson, Francis B., to Combustion Engineering, Inc. Economizer support. 4,480,594, Cl. 122-510.000.

Sulzer-Escher Wyss Limited: *See*—
Schnyder, Eugen, 4,480,452, Cl. 72-16.000.

Sumikawa, Teruaki: *See*—
Takagi, Toshio; Iwanami, Masao; and Sumikawa, Teruaki, 4,480,764, Cl. 221-11.000.

Sumitomo Chemical Company, Limited: *See*—
Fukushima, Nobuo; Nakae, Kiyohiko; and Terazawa, Takayuki, 4,481,254, Cl. 428-329.000.
Sakaguchi, Iwao; and Hayashi, Yoshiaki, 4,481,358, Cl. 544-99.000.

Sumitomo Electric Industries, Inc.: *See*—
Sakamoto, Fukuma; and Izumida, Shizuo, 4,481,678, Cl. 455-619.000.

Sumitomo Metal Industries, Ltd.: *See*—
Kazama, Hisao; Nakanishi, Akito; and Nakayama, Katsuichi, 4,480,474, Cl. 73-600.000.

Sumoto, Tamotsu, to Yugen Kaisha Manthree Shokai. Support mechanism for a driven drum for feeding uniform width tape in a knitted tape manufacturing device. 4,480,365, Cl. 29-2.100.

Sun Research and Development Co.: *See*—
Recchuite, Alexander D., 4,481,140, Cl. 260-399.000.

Sundstrand Corporation: *See*—
Grimm, Duane H.; and Michaels, William J., 4,480,733, Cl. 192-8.00R.
Mehl, Byron R.; Olson, Raymond N.; and Glennon, Timothy F., 4,481,459, Cl. 322-10.000.

Sundstrand Data Control, Inc.: *See*—
Snyder, John D., Jr., 4,480,912, Cl. 356-138.000.

Sunohara, Hideki: *See*—
Morishita, Takashi; Sunohara, Hideki; and Tanoue, Shohachi, 4,481,157, Cl. 264-4.100.

Sunouchi, Akio: *See*—
Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, 4,480,903, Cl. 354-465.000.

Suplinskas, Raymond J.; and Hauze, Albert W., to Avco Corporation. Boron coated silicon carbide filaments. 4,481,257, Cl. 428-366.000.

Sutherland, Robert; and Slocombe, Brian, to Beecham Group p.l.c. Method of treatment. 4,481,210, Cl. 424-271.000.

Suzuki, Hirokazu; and Akiyama, Takehiro, to Fujitsu Limited. TTL Circuit having delay means for delaying the operation until the supply voltage reaches a certain threshold. 4,481,427, Cl. 307-200.00A.

Suzuki, Keizo; Hiraiwa, Atsushi; Takahashi, Shigeru; Nishimatsu, Shigeru; Ninomiya, Ken; and Okudaira, Sadayuki, to Hitachi, Ltd. Method for growing silicon-including film by employing plasma deposition. 4,481,229, Cl. 427-38.000.

Suzuki, Kenkichi: *See*—
Ezawa, Masayoshi; Misumi, Akira; Suzuki, Kenkichi; and Kumada, Masaharu, 4,481,265, Cl. 429-9.000.

Suzuki, Noboru: *See*—
Sugimoto, Osamu; Ishizaka, Shinobu; Tanaka, Youji; and Suzuki, Noboru, 4,481,455, Cl. 318-778.000.

Suzuki, Ryo: *See*—
Tsuchihashi, Michihiro; Otani, Katsuya; and Suzuki, Ryo, 4,481,446, Cl. 315-73.000.

Suzuki, Ryuji: *See*—
Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, 4,480,903, Cl. 354-465.000.

Suzuki, Seiji; Kawate, Kenji; and Tawara, Hiroshi, to Daidotokushuko Kabushikikaisha. Apparatus for conveying strip material. 4,480,777, Cl. 226-15.000.

Suzuki, Seikou: *See*—
Sato, Hideo; Nishihara, Motohisa; Yamada, Kazuji; and Suzuki, Seikou, 4,480,478, Cl. 73-708.000.

Suzuki, Taira: *See*—
Asano, Yuichiro; Suzuki, Taira; Yabe, Tadashi; Kurita, Kunio; Ohga, Suehisa; Hirahashi, Akira; and Momose, Atsushi, 4,480,919, Cl. 356-376.000.

Suzuki, Takehiko: *See*—
Sato, Takahisa; Nakanishi, Yoshiyuki; Maruyama, Keizo; and Suzuki, Takehiko, 4,481,304, Cl. 502-209.000.

Suzuki, Yasuo: *See*—
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; Mochida, Ei; and Mochida, Nobuo, 4,481,137, Cl. 260-112.00R.

Suzuki, Yoshihisa: *See*—
Anahara, Meiji; Suzuki, Yoshihisa; Takasu, Shigeru; and Omori, Hiroshi, 4,480,435, Cl. 57-333.000.

Svagr, Alexander, to SMS Schloemann-Siemag AG. Skew-rolling mill for reducing solid and hollow cross-sections. 4,480,454, Cl. 72-78.000.

Swaffield, John D.: *See*—
Wood, Theodore H.; and Swaffield, John D., 4,481,380, Cl. 174-52.0PE.

Swedberg, N. Einar, to Eaton Corporation. Two-speed gerotor motor. 4,480,971, Cl. 418-61.00B.

Sweet, Robert M.: *See*—
Mahyera, Anil; Sweet, Robert M.; and Brest Van Kempen, Carel J. H., 4,480,842, Cl. 277-22.000.

Sybron Corporation: *See*—
Melisz, John M.; and Jellinek, Frank H., 4,481,246, Cl. 428-210.000.

Syntex (U.S.A.) Inc.: *See*—
Nestor, John J.; and Vickery, Brian H., 4,481,190, Cl. 424-177.000.

Synthelabo: *See*—
Manoury, Philippe; Binet, Jean; and DeFosse, Gerard, 4,481,207, Cl. 424-267.000.

Syva Company: *See*—
Khanna, Pyare; and Ullman, Edwin F., 4,481,136, Cl. 260-112.00R.

Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo , 4,481,204, Cl. 424-262.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo , to Richter Gedeon Vegyeszeti Gyar R.T. E-Homo-ebumane derivatives, process for their preparation, and pharmaceutical compositions containing these compounds. 4,481,204, Cl. 424-262.000.

Szporny, Laszlo : *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Sapi, Janos; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo , 4,481,204, Cl. 424-262.000.

T & L Electronics, Inc.: *See*—
Hickson, Alan D., 4,481,562, Cl. 362-183.000.

Tachibana, Shinro; Araki, Kengo; Ohya, Shizuko; and Yoshida, Seiji, to Eisai Co., Ltd. Heptadecapeptide. 4,481,138, Cl. 260-112.50R.

Tack, Robert D.; Lewtas, Kenneth; and Davies, Brian W., to Exxon Research & Engineering Co. Two component flow improver additive for middle distillate fuel oils. 4,481,013, Cl. 44-62.000.

Tada, Yoshiharu: *See*—
Kitano, Yuichi; and Tada, Yoshiharu, 4,481,452, Cl. 318-681.000.

Taguchi, Kazuto: *See*—
Okabayashi, Makoto; Takeishi, Yasuo; Higuchi, Yoichi; and Taguchi, Kazuto, 4,480,988, Cl. 431-329.000.

Taiho Pharmaceutical Company, Limited: *See*—
Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, 4,481,203, Cl. 424-251.000.

Tajima, Hidemi, to Hoya Corporation. Optical glass. 4,481,299, Cl. 501-73.000.
Takagi, Masashi: *See*—
Nishi, Yasuyuki; Sakurai, Masao; and Takagi, Masashi, 4,480,443, Cl. 62-227.000.
Takagi, Toshio; Iwanami, Masao; and Sumikawa, Teruaki, to Fuji Electric Company, Ltd. Drinking cup storage and feeding device for an automatic vending machine. 4,480,764, Cl. 221-11.000.
Takagi, Yoshihiro; Hirano, Shigeo; and Sugimoto, Tadao, to Fuji Photo Film Co., Ltd. Method of treating direct positive silver halide sensitive material. 4,481,285, Cl. 430-410.000.
Takahashi, Katsuji; Fujii, Shigeharu; and Sagara, Makoto, to Toshiba Kikai Kabushiki Kaisha. Vertical milling and turning machines. 4,480,366, Cl. 29-26.00A.
Takahashi, Kotei, to Nissan Motor Company, Limited. Transaxle lubrication system. 4,480,493, Cl. 74-467.000.
Takahashi, Seiichi: *See*—
Sakata, Hajime; Yokono, Kojiro; and Takahashi, Seiichi, 4,481,233, Cl. 427-68.000.
Takahashi, Shigeru: *See*—
Suzuki, Keizo; Hiraiwa, Atsushi; Takahashi, Shigeru; Nishimatsu, Shigeru; Ninomiya, Ken; and Okudaira, Sadayuki, 4,481,229, Cl. 427-38.000.
Takamizawa, Minoru: *See*—
Obata, Hiroyuki; Takamizawa, Minoru; and Inoue, Yoshio, 4,481,282, Cl. 430-303.000.
Takanashi, Akihiro; Harada, Tatsuo; Akeyama, Masamoto; Kondo, Yataro; Kurosaki, Toshiei; Kuniyoshi, Shinji; Hosaka, Sumio; and Kawamura, Yoshio, to Hitachi, Ltd. Pattern forming apparatus. 4,480,910, Cl. 355-30.000.
Takano, Toshio; and Kobayashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Automatic transmission for four wheel drive automotive vehicles. 4,480,505, Cl. 74-869.000.
Takano, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Electro-magnetic clutch control system for automobiles. 4,480,732, Cl. 192-0.052.
Takasaka, Masahiro: *See*—
Hanmura, Hisao; and Takasaka, Masahiro, 4,481,511, Cl. 340-752.000.
Takashima, Kazuo: *See*—
Saito, Toyokazu; Sanmiya, Seietsu; Hosooka, Akio; Takashima, Kazuo; and Tanaka, Minoru, 4,481,534, Cl. 358-107.000.
Takasu, Shigeru: *See*—
Anahara, Meiji; Suzuki, Yoshihisa; Takasu, Shigeru; and Omori, Hiroshi, 4,480,435, Cl. 57-333.000.
Takasu, Yasuhito; Inoue, Shingo; and Iwata, Toshiharu, to Nippondenso Co., Ltd. Method and apparatus for controlling ignition timing in a multicylinder internal combustion engine. 4,480,615, Cl. 123-416.000.
Takasu, Yoshio: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, 4,481,273, Cl. 430-59.000.
Takeda, Keiso, to Toyota Jidosha Kabushiki Kaisha. Knock control method and apparatus for an internal-combustion engine. 4,480,616, Cl. 123-425.000.
Takeda, Setsuo: *See*—
Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, 4,481,203, Cl. 424-251.000.
Takeda, Tsunezo; and Miseki, Kozo, to Shimadzu Corporation. Quadrupole mass spectrometer. 4,481,415, Cl. 250-292.000.
Takei, Heiichi: *See*—
Kawashima, Sadao; and Takei, Heiichi, 4,481,241, Cl. 428-134.000.
Takeishi, Yasuo: *See*—
Okabayashi, Makoto; Takeishi, Yasuo; Higuchi, Yoichi; and Taguchi, Kazuto, 4,480,988, Cl. 431-329.000.
Takemae, Yoshihiro; and Miyahara, Hatsuo, to Fujitsu Limited. Dynamic Semiconductor memory device. 4,481,610, Cl. 365-182.000.
Takeshita, Ko: *See*—
Hiramatsu, Rihei; Takeshita, Ko; and Inoue, Tokunari, 4,481,461, Cl. 323-272.000.
Takeuchi, Atsushi: *See*—
Higuchi, Mitsuo; and Takeuchi, Atsushi, 4,481,609, Cl. 365-72.000.
Takigawa, Tadahiro; and Sasaki, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. Ion implantation method. 4,481,042, Cl. 148-1.500.
Takiguchi, Michitaka; and Sugaya, Takao, to Brother Kogyo Kabushiki Kaisha. Abnormal condition warning apparatus for a sewing machine. 4,481,507, Cl. 340-679.000.
Takimoto, Masatami: *See*—
Kato, Shinichi; Motosugi, Katsuhiko; Takimoto, Masatami; Yamada, Haruo; Mizuno, Kisaburo; and Teramura, Mitsuyoshi, 4,480,606, Cl. 123-188.00M.
Talbert, Robert L.: *See*—
Roos, Erm; and Talbert, Robert L., 4,481,466, Cl. 324-71.100.
Tamoto, Koji: *See*—
Ishikawa, Shun-ichi; Tamoto, Koji; Iwasaki, Masayuki; and Umehara, Akira, 4,481,276, Cl. 430-281.000.
Tanabe, Takeshi, to Sharp Kabushiki Kaisha. Combined microwave oven and grill oven with automated cooking performance. 4,481,394, Cl. 219-10.55B.
Tanabe, Yoshio: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,481,217, Cl. 424-311.000.
Tanaka, Asami. Method of coloring bakeable porcelain dental restorations. 4,481,227, Cl. 427-2.000.
Tanaka, Haruhiko: *See*—
Makabe, Hachiro; Tanaka, Haruhiko; Orii, Akira; and Kongoh, Takeshi, 4,480,561, Cl. 112-158.00E.
Tanaka, Minoru: *See*—
Saito, Toyokazu; Sanmiya, Seietsu; Hosooka, Akio; Takashima, Kazuo; and Tanaka, Minoru, 4,481,534, Cl. 358-107.000.
Tanaka, Sadaaki, to Sony Corporation. Aperture correction circuit. 4,481,537, Cl. 358-162.000.
Tanaka, Shinichiro: *See*—
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,480,614, Cl. 123-339.000.
Tanaka, Yasunori; and Noda, Shinji, to Fuji Photo Film Co., Ltd. Coating apparatus. 4,480,583, Cl. 118-410.000.
Tanaka, Youji: *See*—
Sugimoto, Osamu; Ishizaka, Shinobu; Tanaka, Youji; and Suzuki, Noboru, 4,481,455, Cl. 318-778.000.
Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,480,597, Cl. 123-51.0BA.
Taneda, Yukinori: *See*—
Yano, Kiyoshi; Taneda, Yukinori; and Kobayashi, Takashi, 4,480,799, Cl. 242-25.00R.
Tange, Shoji; Imajyo, Minoru; Inoue, Ryuzaburo; and Nakagawa, Yasuhiko, to Nissan Motor Company, Limited. Fuel supply system of internal combustion engine. 4,480,620, Cl. 123-478.000.
Tanibe, Shozo: *See*—
Fujisawa, Nobuhiko; Tanibe, Shozo; and Hujiki, Tatsunori, 4,480,545, Cl. 101-183.000.
Taniguchi, Akihiko: *See*—
Anzai, Shunju; Ibuchi, Yoshiaki; and Taniguchi, Akihiko, 4,480,908, Cl. 355-14.0FU.
Taniguchi, Masaharu: *See*—
Fujikawa, Junichi; and Taniguchi, Masaharu, 4,481,280, Cl. 430-281.000.
Tanoue, Shohachi: *See*—
Morishita, Takashi; Sunohara, Hideki; and Tanoue, Shohachi, 4,481,157, Cl. 264-4.100.
Tarara, James A.: *See*—
Foresta, Anthony J.; and Tarara, James A., 4,480,860, Cl. 285-177.000.
Tatchyn, Roman O., to Leland Stanford Junior University, The Board of Trustees of the. Tunable X-ray monochromator using transmission gratings. 4,481,653, Cl. 378-85.000.
Tate, Ronald L. Apparatus for use in fabricating orthodontic appliances. 4,480,995, Cl. 433-54.000.
Tateda, Koichi: *See*—
Matsubayashi, Kazuyuki; and Tateda, Koichi, 4,481,396, Cl. 219-10.55B.
Tauber, Richard: *See*—
Whisenand, Neal; and Tauber, Richard, 4,480,464, Cl. 73-40.000.
Tawara, Hiroshi: *See*—
Suzuki, Seiji; Kawate, Kenji; and Tawara, Hiroshi, 4,480,777, Cl. 226-15.000.
Taylor, Byron K.; and Stewart, Myron C., to RCA Corporation. Velocity correction apparatus for disc record player. 4,481,614, Cl. 369-43.000.
Taylor, Carl R., to AT&T Bell Laboratories. Fibers with multiple coatings. 4,480,898, Cl. 350-96.300.
Taylor, Henry F.: *See*—
Carruthers, Thomas F.; Weller, Joseph F.; and Taylor, Henry F., 4,481,485, Cl. 331-66.000.
Taylor, John H.: *See*—
McCauley, Lewis D.; and Taylor, John H., 4,480,513, Cl. 81-436.000.
TDK Corporation: *See*—
Shumiyashu, Noriaki, 4,480,596, Cl. 128-1.300.
TechAmerica Group, Inc.: *See*—
Fernandez de Castro, Aurora; and Neff, Jerry L., 4,481,094, Cl. 204-180.00G.
Tecumseh Products Company: *See*—
von Kaler, Roland L., 4,480,501, Cl. 74-713.000.
Teglund, Lars; Kosonen, Pentti; and Oldani, Melchiorre, to Aktienbolaget Gustavsberg. Liquid-plug-creating device. 4,480,655, Cl. 137-132.000.
Teijin Chemicals, Ltd.: *See*—
Ohara, Osamu; and Kishimoto, Kazuo, 4,481,330, Cl. 525-67.000.
Tektronix, Inc.: *See*—
Gombert, Glenn J.; and Palmquist, Steven R., 4,481,647, Cl. 375-107.000.
Metz, Arthur J., 4,481,480, Cl. 330-294.000.
Theus, John G., 4,481,549, Cl. 360-45.000.
Teledyne Industries, Inc.: *See*—
Ochsner, Brandt P., 4,481,572, Cl. 364-200.000.
Telefonaktiebolaget L M Ericsson: *See*—
Edsbacker, Carl P. T., 4,481,582, Cl. 364-200.000.
Legerius, Bengt E.; and Siebert, Hans W., 4,480,717, Cl. 184-14.000.
Tellini, Antonio. Re-usable controlled outflow and liquid-tight plug for bottles and the like. 4,480,769, Cl. 222-519.000.
Temes, Steven D.: *See*—
Boden, Richard M.; Temes, Steven D.; and Tyszkiewicz, Theodore J., 4,481,372, Cl. 568-378.000.
Terada, Katsumi: *See*—
Karaki, Kouichi; Oinoue, Kenichi; Tsukaya, Takashi; Terada, Katsumi; Yamasaki, Masafumi; Yusa, Atsushi; and Nakamura, Kazuo, 4,480,636, Cl. 128-6.000.

Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, to Fujisawa Pharmaceutical Co., Ltd. Glycoside phosphate derivatives, pharmaceutical composition of the same and method of use. 4,481,196, Cl. 424-180.000.

Teramura, Mitsuyoshi: *See*—
Kato, Shinichi; Motosugi, Katsuhiko; Takimoto, Masatami; Yamada, Haruo; Mizuno, Kisaburo; and Teramura, Mitsuyoshi, 4,480,606, Cl. 123-188.00M.

Terazawa, Takayuki: *See*—
Fukushima, Nobuo; Nakae, Kiyohiko; and Terazawa, Takayuki, 4,481,254, Cl. 428-329.000.

Terlecky, Boris S.: *See*—
Brodeur, Rene H.; Terlecky, Boris S.; Sellberg, Ronald P.; and Halliar, William R., 4,480,554, Cl. 105-171.000.

Terral, Ben D., to Schlumberger Technology Corporation. Side pocket mandrel system for dual chemical injection. 4,480,687, Cl. 166-117.500.

Terry, Robert: *See*—
Laucis, Peter K.; and Terry, Robert, 4,480,749, Cl. 206-459.000.

Tesch, Gunter; and Gieldanowski, Siegfried, to Breveteam S.A. Textile material. 4,481,247, Cl. 428-234.000.

Teter, Michael P.: *See*—
Snyder, Edward A.; and Teter, Michael P., 4,481,563, Cl. 362-296.000.

Teti, Joseph A., Jr., to LaFrance Corporation. Nameplate manufacturing. 4,480,399, Cl. 40-584.000.

Texaco Inc.: *See*—
Rundell, Herbert A.; and Campsey, Ronald L., 4,480,688, Cl. 166-123.000.

Texas Instruments Incorporated: *See*—
Brehm, Gailon E.; and Scott, Bentley N., 4,481,487, Cl. 331-117.00D.
Hanson, Kerry A., 4,481,642, Cl. 375-9.000.
Jacobs, Henry W.; and Althaus, Stephen E., 4,481,592, Cl. 364-513.000.
Schaake, Herbert F.; and Tregilgas, John H., 4,481,044, Cl. 148-20.300.

Thaler, Warren A.: *See*—
Lundberg, Robert D.; and Thaler, Warren A., 4,481,318, Cl. 524-211.000.

Thayer, Theodore B.: *See*—
Off, Joseph W. A.; Early, Judson H.; Roady, Daniel K.; and Thayer, Theodore B., 4,481,067, Cl. 156-541.000.

Therm-O-Disc, Incorporated: *See*—
Anderson, Richard M.; Snider, Harold F.; and Schmitt, Donald J., 4,481,494, Cl. 337-95.000.

Theus, John G., to Tektronix, Inc. MFM data encoder with write precompensation. 4,481,549, Cl. 360-45.000.

Thomas & Betts Corporation: *See*—
Greenwood, William S., 4,480,889, Cl. 339-99.00R.
Rich, Donald S., 4,480,508, Cl. 81-9.50R.

Thomas, Charles E.; and Wojnarowski, Robert J., to General Electric Company. Turn-off control circuit for self-cleaning ovens. 4,481,404, Cl. 219-398.000.

Thomas, Gerald S., to Lucas Industries Public Limited Company. Liquid fuel injection pump. 4,480,623, Cl. 123-514.000.

Thomas, Joe P.; Rogers, Charles D.; Noll, Richard R.; Peltzer, Harry E.; and Perrine, Steven P., to Metal Detectors, Inc. Metal detector apparatus and method. 4,480,753, Cl. 209-546.000.

Thomas, Mammen; and Koyama, Linda J., to Advanced Micro Devices, Inc. Double planarization process for multilayer metallization of integrated circuit structures. 4,481,070, Cl. 156-643.000.

Thomas, Michael D., to Ryder International Corporation. Reuseable vial cap. 4,480,762, Cl. 215-273.000.

Thompson, David M. Illuminated mast-top wind indicator. 4,481,505, Cl. 340-601.000.

Thompson, Duane T.; Karas, Edwin L.; Root, Ernest F.; and Schlyter, Fredrik, to Foxboro Company, The. Vibration compensating interferometer mirror drive system. 4,480,914, Cl. 356-346.000.

Thompson, Jeffrey W.: *See*—
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,481,093, Cl. 204-159.190.

Thomsen, Ove; and Ronnow, Peter, to A-Betong AB. Method for the production of methane. 4,481,293, Cl. 435-167.000.

Thomson-CSF: *See*—
Arditty, Herve ; Papuchon, Michel; and Peuch, Claude, 4,480,915, Cl. 356-350.000.
Bert, Alain; and Kaminsky, Didier, 4,481,486, Cl. 331-99.000.
Dubois, Jean C.; Gazard, Maryse; Schue, Francois; Giral, Louis; Rolland, Michel; and Aldissi, Mahmoud, 4,481,132, Cl. 252-519.000.
Eumurian, Gregoire; and Gadrault, Robert, 4,481,676, Cl. 455-608.000.
Hareng, Michel; Hehlen, Robert; LeBerre, Serge; and Leclerc, Pierre, 4,481,510, Cl. 340-784.000.

Thuemmler, Fritz: *See*—
Holleck, Helmut; Thuemmler, Fritz; and Prakash, Leo, 4,481,166, Cl. 419-16.000.

Tibbet, Michael D.: *See*—
Witherell, James L.; and Tibbet, Michael D., 4,480,999, Cl. 434-18.000.

Tice, Charles, to Transamerica DeLaval Inc. Adjustable differential fluid level float indicator. 4,480,469, Cl. 73-308.000.

Tikhonova, Olga Y., deceased: *See*—
Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia F., administrator, 4,481,201, Cl. 424-250.000.

Tilley, Donald R.: *See*—
Tscheulin, Fred L.; Tilley, Donald R.; Schubert, Steven K.; and Skyllingstad, William G., 4,481,512, Cl. 340-825.250.

Tilly, Lynn K.: *See*—
Hurt, Alvin G.; and Tilly, Lynn K., 4,480,758, Cl. 213-54.000.

Timms, Donald G., to Enichem Elastomers Limited. Disproportionation of unsaturated acids. 4,481,145, Cl. 260-405.600.

Titus, Rex S.; Kindt, Robert J.; and Peffer. Robert M., to Eastman Kodak Company. Apparatus for mounting discrete image carrier sheets for movement in an electrographic copier. 4,480,906, Cl. 355-3.00R.

Tkotz, Dieter: *See*—
Glock, Alfred; Seebo, Kurt; Schoenung, Bernhard; and Tkotz, Dieter, 4,480,354, Cl. 19-0.250.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Okumura, Yoshiharu; Sakakibara, Tadamori; and Kaneko, Katsumi, 4,481,373, Cl. 568-401.000.

Tobita, Etsuo: *See*—
Nakahara, Yutaka; Haruna, Tohru; and Tobita, Etsuo, 4,481,317, Cl. 524-119.000.

Tocker, Stanley, to Du Pont de Nemours, E. I., and Company. Insecticidal compositions having high concentration of active ingredients. 4,481,215, Cl. 424-298.000.

Todd, Jerald C.: *See*—
Bush, Austin L.; Apperson, Kenneth P.; and Todd, Jerald C., 4,480,460, Cl. 72-410.000.

Todo, Eishiro: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,481,196, Cl. 424-180.000.

Toei Denki Kabushiki Kaisha: *See*—
Ono, Tadahiro; and Miura, Naoshi, 4,481,468, Cl. 324-163.000.

Toganoh, Shigeo: *See*—
Haruta, Masahiro; Hamamoto, Takashi; and Toganoh, Shigeo, 4,481,244, Cl. 428-155.000.

Togawa, Tsuyoshi; Nakamoto, Teruyuki; Iwata, Mitsuo; Ito, Katuhiko; Sano, Hideo; Sekine, Nobutaka; and Shibuya, Tomoe, to Fujikura Ltd. System for controlling temperature of molten resin in cylinder of extruder. 4,480,981, Cl. 425-143.000.

Tohoku Metal Industries, Ltd.: *See*—
Nishino, Hisao; and Kondo, Shigeru, 4,481,431, Cl. 307-300.000.

Tokuno, Masateru; Sawada, Tetsuya; and Ishii, Yoshihiro, to Rengo Co., Ltd. Method and apparatus for splicing web. 4,481,053, Cl. 156-157.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ide, Yuichi; Tsuchiya, Yasutoshi; and Mino, Yoshihito, 4,480,442, Cl. 62-175.000.
Kitazawa, Hiroo, 4,481,643, Cl. 375-12.000.
Murakami, Teruo, 4,481,620, Cl. 369-275.000.
Obama, Masao, 4,480,495, Cl. 74-479.000.
Oozeki, Mikio, 4,481,619, Cl. 369-270.000.
Ota, Naoki, 4,481,665, Cl. 382-48.000.
Takigawa, Tadahiro; and Sasaki, Isao, 4,481,042, Cl. 148-1.500.
Yokota, Tsuneshi, 4,481,613, Cl. 369-56.000.

Tomono, Makoto: *See*—
Itaya, Masahiko; Haneda, Satoshi; and Tomono, Makoto, 4,480,911, Cl. 355-3.0DD.

Tomy Kogyo Co., Inc.: *See*—
Minami, Koichi, 4,480,834, Cl. 273-85.00E.

Tonus, Egidio L. Needle seeder. 4,480,765, Cl. 221-211.000.

Toray Industries, Inc.: *See*—
Fujikawa, Junichi; and Taniguchi, Masaharu, 4,481,280, Cl. 430-281.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Ono, Tadahiro; and Miura, Naoshi, 4,481,468, Cl. 324-163.000.
Takahashi, Katsuji; Fujii, Shigeharu; and Sagara, Makoto, 4,480,366, Cl. 29-26.00A.

Tournier, Edmond: *See*—
Allemand, Robert; Gagelin, Jean-Jacques; and Tournier, Edmond, 4,481,420, Cl. 250-385.000.

Towmotor Corporation: *See*—
Henricks, Gwenne A. E.; Pickering, William; and Wiblin, Wayne T., 4,481,554, Cl. 361-152.000.

Townzen, David, to Kaye Instruments Inc. Method of and apparatus for automatically compensating for variations in output response characteristics of sensors and the like. 4,481,596, Cl. 364-571.000.

Toyo Kogyo Co., Ltd.: *See*—
Koto, Masaaki, 4,480,868, Cl. 296-190.000.

Toyo Umpanki Co., Ltd.: *See*—
Yabuta, Takenobu; and Sugata, Takashi, 4,480,714, Cl. 180-290.000.

Toyoda Gosei Co., Ltd.: *See*—
Itoh, Masaru, 4,481,159, Cl. 264-26.000.

Toyota Jidosha K.K.: *See*—
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,480,614, Cl. 123-339.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kanda, Mutsumi; Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,480,625, Cl. 123-661.000.
Kato, Shinichi; Motosugi, Katsuhiko; Takimoto, Masatami; Yamada, Haruo; Mizuno, Kisaburo; and Teramura, Mitsuyoshi, 4,480,606, Cl. 123-188.00M.
Morishima, Satomi, 4,480,782, Cl. 234-98.000.
Takeda, Keiso, 4,480,616, Cl. 123-425.000.

Toyota Jidosha Kobyo Kabushiki Kaisha: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,480,597, Cl. 123-51.0BA.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,480,499, Cl. 74-695.000.

Transamerica DeLaval Inc.: *See*—
Tice, Charles, 4,480,469, Cl. 73-308.000.

Trapentsiers, Petr T.: *See*—
Eremeev, Anatoly; Kalvinsh, Ivars Y.; Semenikhina, Valentina G.; Liepinsh, Edvards E.; Latvietis, Yan Y.; Anderson, Paul P.; Astapenok, Elena B.; Spruzh, Yazep Y.; Trapentsiers, Petr T.; Podoprigora, Gennady I.; and Giller, Solomon A., deceased, 4,481,218, Cl. 424-316.000.

Traub, Alan C.: *See*—
Vanzetti, Riccardo; Dostoomian, Ashod S.; and Traub, Alan C., 4,481,418, Cl. 250-338.000.

Travers, Roger: *See*—
Maurice, Jean; Travers, Roger; and Camus, Jean-Paul, 4,481,397, Cl. 219-10.61R.

Traylor, Francis T.: *See*—
Lee, Lawrence C.; Tyagi, Mukul K.; Furnas, Michael W.; and Traylor, Francis T., 4,481,020, Cl. 55-203.000.

Trebor Industries, Inc.: *See*—
Rosenthal, Robert D., 4,480,706, Cl. 177-50.000.

Trefethern, George M.; and Bissell, Marian J. Propelled pontoon chair. 4,480,568, Cl. 114-61.000.

Tregilgas, John H.: *See*—
Schaake, Herbert F.; and Tregilgas, John H., 4,481,044, Cl. 148-20.300.

Trend Setter Products, Inc.: *See*—
Eggett, John G., 4,480,352, Cl. 15-214.000.

Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,481,221, Cl. 426-3.000.

Trilog, Inc.: *See*—
Grummett, Lorne H., 4,480,541, Cl. 101-93.040.

Trinh, Toan; and Scheper, John S., to Procter & Gamble Company, The. No rinse liquid car cleaner with solid polymers. 4,481,126, Cl. 252-174.230.

Trotter, Jimmy R.: *See*—
McConnell, Richard L.; Joyner, Frederick B.; and Trotter, Jimmy R., 4,481,351, Cl. 528-272.000.
McConnell, Richard L.; Trotter, Jimmy R.; and Joyner, Frederick B., 4,481,352, Cl. 528-302.000.

Trouve, Claude: *See*—
Cabestany, Jean; and Trouve, Claude, 4,481,116, Cl. 210-735.000.

Trus-Us, Inc.: *See*—
Shacket, Sheldon; and Helfman, Robert, 4,480,420, Cl. 52-745.000.

Truss, Peter, to British Aerospace Public Limited Company. Extendable structures. 4,480,415, Cl. 52-108.000.

TRW Inc.: *See*—
Lee, Lawrence C.; Tyagi, Mukul K.; Furnas, Michael W.; and Traylor, Francis T., 4,481,020, Cl. 55-203.000.

Trybulski, Eugene J.: *See*—
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Tschudy, Donald B.; and Tschudy, Richard D. Building construction. 4,480,414, Cl. 52-82.000.

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Tsuchiya, Hiroaki, to Canon Kabushiki Kaisha. Potential control on photosensitive member. 4,480,909, Cl. 355-14.0CH.

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Union Oil Company of California: *See*—
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U.S. Philips Corporation: *See*—
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UOP Inc.: *See*—
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Upton, Garthop. Soap holding and dispensing means. 4,480,939, Cl. 401-201.000.

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Vachon, Rene . Snowblower truck assembly and lateral swivelling snowblower equipment therefor. 4,480,397, Cl. 37-234.000.

Vackier, Leo N., to AGFA-GEVAERT N.V. Apparatus for the liquid processing of a surface of a material in the form of a sheet, a web or a plate. 4,480,907, Cl. 355-10.000.

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Valdespino, Joseph M.: *See*—
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Valev, Assen, to Steyr-Daimler-Puch Aktiengesellschaft. Reciprocating internal combustion engine and support assembly. 4,480,608, Cl. 123-195.00C.

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Van De Bogart, Lloyd J., to Boeing Company, The. Combination opposed helix router for routing composite material face sheets having honeycomb core. 4,480,949, Cl. 407-54.000.

Vanderburg, Ralph W., to Axelson, Inc. In-service test valve. 4,480,653, Cl. 137-112.000.

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van der Veen, Abraham; and van der Veen, Jelle. Container for ground material removed by a ground working device from the bottom of a watercourse. 4,480,569, Cl. 114-74.00T.

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van Gils, Wilhelmus A., to U.S. Philips Corporation. Method of manufacturing a picture display tube having a gas-absorbing layer; picture display tube thus manufactured, and gettering device suitable for such a method. 4,481,441, Cl. 313-481.000.

Vann, Roy R., to Geo Vann, Inc. Accelerated downhole pressure testing. 4,480,690, Cl. 166-250.000.

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Varma, Ravi K., to E. R. Squibb & Sons, Inc. 17-Substituted thia-17-alkyl(or alkenyl or alkynyl)androstenes. 4,481,144, Cl. 260-397.450.

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Vaubel, Gert; and Beier, Heinz, to Benteler-Werke AG. Adjustable sliding mold for continuous casting installations. 4,480,976, Cl. 425-186.000.

Vecellio, Bernardino, to Societa Cavi Pirelli S.p.A. Electric cable with insulation of biaxially oriented, polymeric tape with a coating of grease. 4,481,259, Cl. 428-377.000.

Ventrella, Ettore. Modular system for space grid structures. 4,480,418, Cl. 52-648.000.

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Verhyen, Larry L., deceased: *See*—
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Voecks, William F., Jr.: *See*—
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Voest-Alpine Aktiengesellschaft: *See*—
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von Bebenburg, Walter, deceased (by von Bebenburg, Marie, administratrix); and Siegfried, Pauluhn, to Degussa Aktiengesellschaft. 2-Amino-3-carbethoxyamino-6-(p-fluoro-benzylamino)-pyridine-malate. 4,481,205, Cl. 424-263.000.

von Hagen, Wolf R.; and Jurgens, Erwin, to Union Special G.m.b.H. Sewing machine loop spreading mechanism. 4,480,562, Cl. 112-200.000.

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von Wimmersperg, Heinrich F. Infant restraint for vehicles. 4,480,870, Cl. 297-216.000.

Vratny, Frederick, to AT&T Bell Laboratories. Polyarylate polymer coatings. 4,481,251, Cl. 428-312.600.

Vsesojuznoe Nauchno-Proizvodstven Noe Obiedinenie Tselljulozno-Bumazhnoi Promyshlennosti: *See*—
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VSI Corporation: *See*—
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Kobler, Ulrich; and Wanka, Eberhard, 4,481,493, Cl. 335-179.000.

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Waters, James B., Jr. Board blocks with pieces moved by interconnected end blocks. 4,480,839, Cl. 273-258.000.
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Franey, Terence E.; Watkins, Richard B.; and Woolfolk, Austin W., 4,481,255, Cl. 428-355.000.
Watkinson, Sarah C., to National Research Development Corporation. Inhibition of growth in fungi. 4,481,219, Cl. 424-319.000.
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Fleischer, Dietrich; Weber, Eckhard; and Brandrup, Johannes, 4,481,333, Cl. 525-192.000.
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Dukes, John N.; Bryson, Charles E., III; Weber, Lynn; and Morganthaler, Mark, 4,480,913, Cl. 356-319.000.
Webster Spring Co. Inc.: *See—*
Marcinczyk, Henry J.; and Gurcew, Ronald J., 4,480,823, Cl. 267-91.000.
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Spiegel, Rene ; and Weidmann, Hans, 4,481,206, Cl. 424-267.000.
Weinert, Friedrich. Coated self-extinguished cigarette. 4,480,650, Cl. 131-349.000.
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Wendt, Hans J. Internal combustion engine using several kinds of fuels, with electronically adjustable intake and exhaust valves and injection device. 4,480,611, Cl. 123-197.00C.
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Cartwright, Jerry G., 4,480,755, Cl. 211-60.00T.
Weskamp, Wilhelm; and Stewen, Wilhelm, to Ruhrkohle Aktiengesellscaft. Coke oven charge mixtures with coal binder. 4,481,011, Cl. 44-51.000.
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Cather, Robert L., 4,480,880, Cl. 308-6.00R.
Conway, Harry E., 4,481,423, Cl. 250-551.000.
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Jackovitz, John F.; and Pantier, Earl A., 4,481,128, Cl. 252-182.100.
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Miller, Robert C.; and Carr, Walter J., Jr., 4,481,471, Cl. 324-240.000.
Sattler, Frank A.; and Gorton, William S., Jr., 4,481,258, Cl. 428-371.000.
Tsao, Mike C.; and Mancuso, James F., 4,480,475, Cl. 73-610.000.
Young, Frederick J.; Hughes, William F.; Deis, Daniel W.; and McNab, Ian R., 4,480,523, Cl. 89-8.000.
Westlund, Gerald A.: *See—*
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Dockner, Toni; Pommer, Ernst-Heinrich; and Wetzler, Matthias, 4,481,211, Cl. 424-273.00R.
Wheelabrator-Frye Inc.: *See—*
Schulte, Harold F.; Leliaert, Raymond M.; and Rohr, Robert D., 4,480,413, Cl. 51-435.000.
Whirlpool Corporation: *See—*
Getz, Edward H.; and Ott, Clarence R., Jr., 4,480,449, Cl. 68-12.00R.
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Whitcomb, Jon P.: *See—*
Kazor, Thomas R.; and Whitcomb, Jon P., 4,480,747, Cl. 206-334.000.
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White, Robert W.; and Kuzan, Frank R., to General Electric Company. Method of assembling a dynamoelectric machine and method of securing a set of beams of a stationary assembly for a dynamoelectric machine to opposite end frames therefor. 4,480,378, Cl. 29-596.000.
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Andrews, Errol F.; Peterson, Edward A.; Casbolt, Jeffrey N.; Holt, Kevin E.; McMillan, John M.; and Whiting, Robert E., 4,480,955, Cl. 414-723.000.
Whittaker Corporation: *See—*
LoFiego, Louis, 4,480,551, Cl. 102-245.000.
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Henricks, Gwenne A. E.; Pickering, William; and Wiblin, Wayne T., 4,481,554, Cl. 361-152.000.
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Long, Edward M.; and Wickersham, Ronald J., 4,481,662, Cl. 381-98.000.
Wier, Alexander, Jr. Apparatus for treating stack gases. 4,481,170, Cl. 422-168.000.
Wiker, Gordon A., to United States of America, National Aeronautics and Space Administration. Automatic multi-banking of memory for microprocessors. 4,481,570, Cl. 364-200.000.
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Frank, Wilhelm, 4,480,406, Cl. 49-153.000.
Wilhoite, Murray O., to Martin Industries, Inc. Jacketed combustion type heater with blowback prevention feature. 4,480,630, Cl. 126-287.000.
Willcox, Frederick P. Keyboard having rotationally positionable indicia for indicating type font in use. 4,480,932, Cl. 400-82.000.
Willenberg, Bernd: *See—*
Hocker, Jurgen; Merten, Rudolf; and Willenberg, Bernd, 4,481,312, Cl. 524-40.000.
Williams, Christian B.: *See—*
Beukers, John M.; and Williams, Christian B., 4,481,514, Cl. 340-870.100.
Williams, Michael. Gas furnace system. 4,480,629, Cl. 126-99.00R.
Williams, Theodore R. Cartridge adapter for programmable video games. 4,480,835, Cl. 273-148.00B.
Williams, Thomas D.: *See—*
Gilham, Dennis T.; Williams, Thomas D.; Ananthan, Manickam; and Herring, William J., 4,481,604, Cl. 364-900.000.
Williams, Wilburn R. Apparatus for supporting a cantilevered beam from a T-shaped post. 4,480,403, Cl. 47-42.000.
Wilson Industries, Inc.: *See—*
Sharp, Harper E.; and Smither, Miles A., 4,480,391, Cl. 33-314.000.
Wilson, Kermit H.; and Carlson, Ronald R., to Sico Incorporated. Adjustable folding ironing board. 4,480,556, Cl. 108-48.000.
Wilson Sales Co., Inc.: *See—*
Miller, Charles G.; and Stephens, James B., 4,480,894, Cl. 350-167.000.
Wilwerding, Dennis J., to Honeywell Inc. Strip mirror radiation splitter for range determination systems. 4,481,413, Cl. 250-204.000.
Wind, Joseph H., to Bigelow-Sanford, Inc. Shipping pallet and container. 4,480,748, Cl. 206-386.000.
Winfree, Jules P.; Chin, Herbert A.; and O'Connell, Thomas E., to United Technologies Corporation. High modulus shafts. 4,481,047, Cl. 148-429.000.
Winkler, Ottmar; and Pfaller, Egon, to SKF Kugellagerfabriken GmbH. Axial piston pump. 4,480,529, Cl. 92-31.000.
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Wirick, Michael P.; and Wright, James P., to Hughes Aircraft Company. Process of fabricating target for calibrating and testing infrared detection devices. 4,480,372, Cl. 29-458.000.
Wirpsza, Zygmunt; and Kowalski, Krzysztof, to Wyzsza Szkola Inzynierska Im. Kazimierza Pulaskiego. Method of producing polymers of the polyurethane type. 4,481,346, Cl. 528-73.000.
Wirth, Xaver, to Knorr-Bremse GmbH. Suspension arrangement of movable parts, especially of disk brakes of rail vehicles. 4,480,722, Cl. 188-59.000.
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DeLuca, Hector F.; Schnoes, Heinrich K.; Chu, John Y.; and Kabakoff, Bruce D., 4,481,198, Cl. 424-236.000.
Witco Chemical Corporation: *See—*
Root, Jon C.; Barnes, John F.; and Rosson, Dennis M., 4,481,122, Cl. 252-32.70E.
Witherell, James L.; and Tibbet, Michael D., to Advanced .45 Technology. Firearm recoil simulator. 4,480,999, Cl. 434-18.000.
Wittig, Karl R., to North American Philips Corporation. Method and apparatus for the real-time measurement of the small signal gain of an amplifier. 4,481,477, Cl. 330-2.000.
Witwer, Keith A., to Industra Products, Inc. Stack height adjustment for coil placing machines. 4,480,379, Cl. 29-596.000.
Witzel, Mary K.: *See—*
Flink, Leslie R.; Fox, Bryce J.; and Witzel, Mary K., 4,480,393, Cl. 34-27.000.
Wojnarowski, Robert J.: *See—*
Thomas, Charles E.; and Wojnarowski, Robert J., 4,481,404, Cl. 219-398.000.
Wolf, Gerhard D.: *See—*
Ebneth, Harold; Preis, Lothar; Giesecke, Henning; and Wolf, Gerhard D., 4,481,249, Cl. 428-288.000.
Wolff, Robin K.: *See—*
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Wolfram, Joachim W., to Ethyl Corporation. Process for preparing α-keto-carboxylic acids from acyl halides. 4,481,368, Cl. 562-406.000.
Wolfram, Joachim W., to Ethyl Corporation. Preparation of α-keto-carboxylic acids from acyl halides. 4,481,369, Cl. 562-406.000.

Wollbeck, Rudi; and Zang, Thomas, to Akzo NV. Arrangement for heat and mass transfer by means of hollow fibers. 4,480,683, Cl. 165-70.000.

Wood, John F., to Hofmann Corporation Automotive Service Equipment. Electronic wheel balancer for vehicle wheels. 4,480,472, Cl. 73-462.000.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 4,480,746, Cl. 206-141.000.

Wood, Theodore H.; and Swaffield, John D., to Alden Research Foundation. High voltage insulator for electrical components having telescoping insulative sleeves. 4,481,380, Cl. 174-52.0PE.

Woodruff, Frederick W., to Ransburg Corporation. Electrostatic coating system. 4,481,557, Cl. 361-235.000.

Woodruff, Keith F., to American Cyanamid Company. Flexible diaphragm for dispensing product. 4,480,940, Cl. 401-206.000.

Woodson, Wayne D., to CL Industries, Inc. Furfuryl esters and resins. 4,481,310, Cl. 523-144.000.

Woolfolk, Austin W.: *See*—
Franey, Terence E.; Watkins, Richard B.; and Woolfolk, Austin W., 4,481,255, Cl. 428-355.000.

Worrix, Matthew L., to Siemens-Allis, Inc. Voltage isolater switch with pivoted contact assemblies. 4,481,387, Cl. 200-48.00R.

Wright, Benny W.: *See*—
Fagerburg, David R.; Shepherd, Freddie A.; Wright, Benny W.; and Sand, I. Daniel, 4,481,238, Cl. 428-35.000.

Wright, James P.: *See*—
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Wright State University: *See*—
Petrofsky, Jerrold S.; Glaser, Roger M.; Petrofsky, Steven H.; and Heaton, Harry H., III, 4,480,830, Cl. 272-117.000.

Wu, Jeng-Shyong. Electrical plug and socket having replaceable overcurrent-protection device with safety latch means. 4,480,891, Cl. 339-147.00P.

Wunder, Friedrich; Leupold, Ernst I.; and Litterer, Heinz, to Hoechst Aktiengesellschaft. Process for the synthesis of lower olefins from methanol and/or dimethyl ether. 4,481,376, Cl. 585-640.000.

Wunderlich, Donald K., to Atlantic Richfield Company. Block pattern method for in situ gasification of subterranean carbonaceous deposits. 4,480,689, Cl. 166-245.000.

Wurmli, Arthur, to Rieter Machine Works Limited. Apparatus for sorting conical bobbin tubes. 4,480,740, Cl. 198-400.000.

Wurster, Herbert K.: *See*—
Kubota, Tomio; and Wurster, Herbert K., 4,481,270, Cl. 430-55.000.

Wyrsza Szkola Inzynierska Im. Kazimierza Pulaskiego: *See*—
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Xedar Corporation: *See*—
Hodd, Donald E.; and Bucher, Hans R., 4,481,535, Cl. 358-113.000.

Xerox Corporation: *See*—
Acquaviva, Thomas, 4,480,824, Cl. 271-3.100.
Boggs, David R.; and Shoch, John F., 4,481,626, Cl. 370-85.000.
Mabry, C. Thomas, 4,481,617, Cl. 369-77.200.
Sprague, Robert A., 4,480,899, Cl. 350-356.000.

Yaari, Yigal Y. Screwdriver for manual or power operation. 4,480,512, Cl. 81-436.000.

Yabe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, to Hitachi, Ltd. Method of producing itegral electrode structure for electron gun. 4,481,003, Cl. 445-49.000.

Yabe, Tadashi: *See*—
Asano, Yuichiro; Suzuki, Taira; Yabe, Tadashi; Kurita, Kunio; Ohga, Suehisa; Hirahashi, Akira; and Momose, Atsushi, 4,480,919, Cl. 356-376.000.

Yabuta, Takenobu; and Sugata, Takashi, to Toyo Umpanki Co., Ltd. System for preventing carrier from turning sideways. 4,480,714, Cl. 180-290.000.

Yacoboski, Anton, to Aquatic Exercise Products, Inc. Aquatic exercising and body toning device. 4,480,829, Cl. 272-116.000.

Yagi, Toshihiko: *See*—
Yamada, Yoshitaka; Iijima, Toshifumi; Yagi, Toshihiko; Haga, Yoshihiro; Kumashiro, Kenji; and Menjo, Hiroshi, 4,481,288, Cl. 430-506.000.

Yamada, Haruo: *See*—
Kato, Shinichi; Motosugi, Katsuhiko; Takimoto, Masatami; Yamada, Haruo; Mizuno, Kinaburo; and Teramura, Mitsuyoshi, 4,480,606, Cl. 123-188.00M.

Yamada, Kazuji: *See*—
Sato, Hideo; Nishihara, Motohisa; Yamada, Kazuji; and Suzuki, Seikou, 4,480,478, Cl. 73-708.000.

Yamada, Yoshitaka; Iijima, Toshifumi; Yagi, Toshihiko; Haga, Yoshihiro; Kumashiro, Kenji; and Menjo, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material. 4,481,288, Cl. 430-506.000.

Yamaguchi, Kazuo: *See*—
Ohnishi, Haruo; Yamaguchi, Kazuo; Suzuki, Yasuo; Mochida, Ei; and Mochida, Nobuo, 4,481,137, Cl. 260-112.00R.

Yamakawa, Toru, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine provided with a plurality of power units. 4,480,612, Cl. 123-198.00F.

Yamamori, Takahiro; and Iwanaga, Kazuyoshi, to Nissan Motor Company, Limited. Gear noise suppresing type final gear train of transaxle. 4,480,500, Cl. 74-713.000.

Yamamuro, Kiyohiko: *See*—
Kishimoto, Shinzo; and Yamamuro, Kiyohiko, 4,481,290, Cl. 430-543.000.

Yamane, Ken, to Nissan Motor Company, Limited. Supply-air cooling system for an engine including a turbocharger. 4,480,439, Cl. 60-599.000.

Yamasaki, Masafumi: *See*—
Karaki, Kouichi; Oinoue, Kenichi; Tsukaya, Takashi; Terada, Katsumi; Yamasaki, Masafumi; Yusa, Atsushi; and Nakamura, Kazuo, 4,480,636, Cl. 128-6.000.

Yamato, Satoshi: *See*—
Nakagawa, Katsuya; and Yamato, Satoshi, 4,481,426, Cl. 307-91.000.

Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, to Eisai Co., Ltd. α,β-Dihydropolyprenyl derivatives useful in treating hepatitis. 4,481,217, Cl. 424-311.000.

Yamauchi, Masaaki: *See*—
Yabe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, 4,481,003, Cl. 445-49.000.

Yamazaki, Tadashi: *See*—
Mandai, Tomomasa; Ohta, Hiromi; Yamazaki, Tadashi; and Urakawa, Yoshihisa, 4,480,987, Cl. 431-304.000.

Yan, Tsoung Y., to Mobil Oil Corporation. Production of low-metal and low-sulfur coke from high-metal and high-sulfur resids. 4,481,101, Cl. 208-50.000.

Yanagida, Tuneo, to Olympus Optical Co., Ltd. Magnetic recording and reproducing apparatus. 4,481,548, Cl. 360-44.000.

Yanagiuchi, Shigenobu: *See*—
Kamei, Fumio; and Yanagiuchi, Shigenobu, 4,481,508, Cl. 340-712.000.

Yano, Kiyoshi; Taneda, Yukinori; and Kobayashi, Takashi, to Hitachi, Ltd. Apparatus for controlling tension applied onto an electric wire in a winding machine. 4,480,799, Cl. 242-25.00R.

Yano, Mitsuru; and Inoue, Akira, to Hitachi Metals, Ltd. Wheel plate. 4,480,849, Cl. 280-433.000.

Yeater, Robert P., to Mobay Chemical Corporation. Polyol blends. 4,481,127, Cl. 252-182.000.

Yokono, Kojiro: *See*—
Sakata, Hajime; Yokono, Kojiro; and Takahashi, Seiichi, 4,481,233, Cl. 427-68.000.

Yokota, Tsuneshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical disk apparatus. 4,481,613, Cl. 369-56.000.

Yokote, Sachio: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; Maki, Masami; Yokote, Sachio; Sekiguchi, Katsumi; Sasagawa, Katsuyoshi; and Imai, Masao, 4,481,131, Cl. 252-511.000.

Yoneda, Yasuhiro: *See*—
Naito, Jiro; Yoneda, Yasuhiro; and Kitamura, Kenroh, 4,481,279, Cl. 430-280.000.

Yoshida, Akihiro, to Kabushiki Kaisha Yamada Dobby. Means for correcting the position of bottom dead center in a press. 4,480,538, Cl. 100-48.000.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Yoshida, Tokuji, 4,480,432, Cl. 57-58.650.

Yoshida, Masayuki; Matsumoto, Fumio; and Otsuka, Shigeharu, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic contact device. 4,481,555, Cl. 361-155.000.

Yoshida, Seiji: *See*—
Tachibana, Shinro; Araki, Kengo; Ohya, Shizuko; and Yoshida, Seiji, 4,481,138, Cl. 260-112.50R.

Yoshida, Takao: *See*—
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Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,481,221, Cl. 426-3.000.

Yoshida, Tokuji, to Yoshida Kogyo Kabushiki Kaisha. Inclined vertical type stranding machine. 4,480,432, Cl. 57-58.650.

Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, to Asahi-Dow Limited. Composition for drawn film, cold drawn film made of said composition and process for manufacture of said film. 4,481,334, Cl. 525-211.000.

Yoshinaga, Toru: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Yoshinaga, Toru; Abe, Seiko; and Watanabe, Kazuhide, 4,480,619, Cl. 123-446.000.

Yoshino, Hisao: *See*—
Noguchi, Hitoshi; Akiyama, Tomoyuki; Akama, Hideo; Okara, Hideo; and Yoshino, Hisao, 4,481,464, Cl. 324-57.0PS.

Yoshino Kogyosho Co., Ltd.: *See*—
Ota, Akiho; and Negishi, Fumio, 4,481,163, Cl. 264-513.000.

Yoshino, Masaki, to Fuji Xerox Co., Ltd. Cleaning and developing unit. 4,480,905, Cl. 355-3.0DD.

Yoshioka, Tamotsu: *See*—
Ishii, Keizou; Mizuguchi, Ryuzo; Ishikura, Shinichi; and Yoshioka, Tamotsu, 4,481,150, Cl. 260-513.00N.

Yoshioka, Teruo; Miyazawa, Toshio; Uchida, Kuninobu; and Asai, Akimichi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic assembling apparatus for uniform-speed joint. 4,480,383, Cl. 29-822.000.

Young, Charles A.; and Geelhood, Bruce D., to United States of America, Navy. Lithium-6 coated wire mesh neutron detector. 4,481,421, Cl. 250-390.000.

Young, Dean A.; and Koepke, Jeffery W., to Union Oil Company of California. Cracking with catalytically active amorphous silica. 4,481,102, Cl. 208-120.000.

Young, Frederick J.; Hughes, William F.; Deis, Daniel W.; and McNab, Ian R., to Westinghouse Electric Corp. Electromagnetic projectile

launching system with a concentric rail geometry. 4,480,523, Cl. 89-8.000.
Young, William W., to Office Specialty Division of Hollanding Inc. Anti-tip blocking device. 4,480,883, Cl. 312-220.000.
Yrjala, Illmo: *See*—
Reilama, Ismo; Vainiotalo, Arto; and Yrjala, Illmo, 4,481,074, Cl. 162-36.000.
Yugen Kaisha Manthree Shokai: *See*—
Sumoto, Tamotsu, 4,480,365, Cl. 29-2.100.
Yusa, Atsushi: *See*—
Karaki, Kouichi; Oinoue, Kenichi; Tsukaya, Takashi; Terada, Katsumi; Yamasaki, Masafumi; Yusa, Atsushi; and Nakamura, Kazuo, 4,480,636, Cl. 128-6.000.
Zabler, Erich: *See*—
Hauler, Peter; Rothley, Manfred; and Zabler, Erich, 4,481,469, Cl. 324-174.000.
Zach, Franz C.; Bose, Bimal K.; Espelage, Paul M.; and Sicko, John S., to General Electric Company. Method for providing adaptive control of variable speed AC motor drives. 4,481,457, Cl. 318-803.000.
Zacharias, Theodor; Gerhards, Hans D.; and Staat, Karlhans, to Kocks Technik GmbH & Co. Article ejection apparatus. 4,480,515, Cl. 83-81.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Nembach, Siegfried, 4,480,502, Cl. 74-733.000.
Zamskaya, Alla N.: *See*—
Dorokhova, Margarita I.; Zamskaya, Alla N.; Minakova, Sofya M.; Safonova, Tamara S.; Chernov, Vladimir A.; Levshina, Kira V., deceased; Mizeri, Alexandr A., administrator; Tikhonova, Olga Y., deceased; and Shardakova, Emilia F., administrator, 4,481,201, Cl. 424-250.000.
Zang, Thomas: *See*—
Wollbeck, Rudi; and Zang, Thomas, 4,480,683, Cl. 165-70.000.
Zavod "Elektroakustika": *See*—
Vassilev, Vassil B.; Sofiyanski, Vassil M.; Vassilev, Boris V.; Danchev, Panayot Y.; Angelov, Angel B.; Strandjaliev, Yordan M.; and Kehayov, Georgi S., 4,481,482, Cl. 330-297.000.
Zeitlin, Robert: *See*—
Shida, Mitsuzo; Zeitlin, Robert; Machonis, John, Jr.; and Adur, Ashok M., 4,481,262, Cl. 428-441.000.
Zemlyavichus, Pranas V.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Shumikhin, Vladimir S.; Kucherenko, Sergei V.; Zhelnis, Mechislav V.; and Zemlyavichus, Pranas V., 4,480,820, Cl. 266-44.000.
Zenith Electronics Corporation: *See*—
Balaban, Suchen, 4,481,564, Cl. 363-21.000.
Gorski, Richard M., 4,481,445, Cl. 315-14.000.
Zetronic S.p.A.: *See*—
Bergamin, Vito, 4,480,886, Cl. 339-75.0MP.
Zhelnis, Mechislav V.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Shumikhin, Vladimir S.; Kucherenko, Sergei V.; Zhelnis, Mechislav V.; and Zemlyavichus, Pranas V., 4,480,820, Cl. 266-44.000.
Zhukov, Leonid F.; Chugunny, Evgeny G.; Shumikhin, Vladimir S.; Kucherenko, Sergei V.; Zhelnis, Mechislav V.; and Zemlyavichus, Pranas V., to Institut Problem Litia Akademii Nauk Ukrainskoi SSR. Method of lining metallurgical assembly. 4,480,820, Cl. 266-44.000.
Zimmermann, Jos.: *See*—
Beyer, Walter; and Beyer, Joachim, 4,480,563, Cl. 112-222.000.
Zimmermann, Rolf: *See*—
Hesse, Wolfgang; Ritz, Jurgen; and Zimmermann, Rolf, 4,481,311, Cl. 523-424.000.
Zimmermann, Wolfgang: *See*—
Harreus, Albrecht; Kaiser, Eduard; Seip, Detlev; and Zimmermann, Wolfgang, 4,481,328, Cl. 524-493.000.
Zollner, Dieter; Conradty, Claudio; and Rittmann, Friedrich, to Arc Technologies Systems Ltd. Electrode for electric arc furnaces. 4,481,500, Cl. 373-93.000.
Zucal, Thomas A.; and McIntosh, John D., to Owens-Illinois, Inc. Vapor detection tube and method of testing for a vapor. 4,481,297, Cl. 436-181.000.
Zumbusch, Steven J., to Eaton Corporation. Gerotor motor and case drain flow arrangement therefor. 4,480,972, Cl. 418-61.00B.
2500 Corporation, The: *See*—
Roth, David W., 4,481,240, Cl. 428-95.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF NOVEMBER, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cichy, Paul: *See*—
Walker, Thomas B.; Seider, Robert J.; and Cichy, Paul, Re. 31,725, Cl. 51-309.000.

Eckberg, Richard P., to General Electric Company. Vinyl gum cure accelerators for addition-cure silicone. Re. 31,727, Cl. 428-429.000.

General Electric Company: *See*—
Eckberg, Richard P., Re. 31,727, Cl. 428-429.000.

Isaka, Yoshiharu, to Yamaha Hatsudoki Kabushiki Kaisha. Motorcycle exhaust systems. Re. 31,724, Cl. 180-219.000.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, Re. 31,726, Cl. 156-363.000.

Kennecott Corporation: *See*—
Walker, Thomas B.; Seider, Robert J.; and Cichy, Paul, Re. 31,725, Cl. 51-309.000.

Perkins Research & Manufacturing Co.: *See*—
Simmonds, James F., Re. 31,728, Cl. 179-175.30R.

Product Design & Development Inc.: *See*—
Sterner, Maurice E., Jr., Re. 31,721, Cl. 49-129.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Correction label applying device for a label printing machine. Re. 31,726, Cl. 156-363.000.

Seider, Robert J.: *See*—
Walker, Thomas B.; Seider, Robert J.; and Cichy, Paul, Re. 31,725, Cl. 51-309.000.

Shaw, Robert F. Surgical cutting instrument having electrically heated cutting edge. Re. 31,723, Cl. 128-303.100.

Simmonds, James F., to Perkins Research & Manufacturing Co. Test set. Re. 31,728, Cl. 179-175.30R.

Steinberger, Ned. Stringed musical instruments. Re. 31,722, Cl. 84-327.000.

Sterner, Maurice E., Jr., to Product Design & Development Inc. Insulated multiple component single plane building structure portal closure. Re. 31,721, Cl. 49-129.000.

Walker, Thomas B.; Seider, Robert J.; and Cichy, Paul, to Kennecott Corporation. Fused aluminum oxide abrasive grain containing reduced titanium oxide. Re. 31,725, Cl. 51-309.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Isaka, Yoshiharu, Re. 31,724, Cl. 180-219.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bates Industries, Inc.: *See*—
Larsen, Harold H.; and Oehring, Robert E., B1 8,236,535, Cl. D26-28.000.

Dimond, Herbert M.: *See*—
Klein, Keith W.; and Dimond, Herbert M., B1 3,671,890, Cl. 335-22.000.

General Electric Company: *See*—
Klein, Keith W.; and Dimond, Herbert M., B1 3,671,890, Cl. 335-22.000.

Hine, Gordon; and Mathis, Robert D., to Logan Manufacturing Co. Variable wing plow blade and mounting structure therefore. B1 4,356,645, 11-6-84, Cl. 37-281.000.

Klein, Keith W.; and Dimond, Herbert M., to General Electric Company. Manually operable molded case circuit breaker with special trip testing means. B1 3,671,890, 11-6-84, Cl. 335-22.000.

Larsen, Harold H.; and Oehring, Robert E., to Bates Industries, Inc. Vehicle light. B1 8,236,535, 11-6-84, Cl. D26-28.000.

Logan Manufacturing Co.: *See*—
Hine, Gordon; and Mathis, Robert D., B1 4,356,645, Cl. 37-281.000.

Mathis, Robert D.: *See*—
Hine, Gordon; and Mathis, Robert D., B1 4,356,645, Cl. 37-281.000.

Oehring, Robert E.: *See*—
Larsen, Harold H.; and Oehring, Robert E., B1 8,236,535, Cl. D26-28.000.

LIST OF DESIGN PATENTEES

Abseck, Stuart. Paper moving and display unit for fanfolded computer printout paper. 276,244, 11-6-84, Cl. D19-91.000.

Akiyama, Kunio, to Sharp Corporation. Computer keyboard. 276,230, 11-6-84, Cl. D14-100.000.

Akiyama, Kunio, to Sharp Corporation. Computer display. 276,236, 11-6-84, Cl. D14-113.000.

American Commercial, Incorporated: *See*—
Seibel, Ben, 276,200, Cl. D7-13.000.

American Standard Inc.: *See*—
Fabian, Wolfgang, 276,257, Cl. D23-25.000.

Armbruster, Joseph M. Air circulator. 276,263, 11-6-84, Cl. D23-151.000.

Arrow Trading Co., Inc.: *See*—
Lee, Peter, 276,211, Cl. D8-83.000.

AT&T Bell Laboratories: *See*—
Bartley, Keith D.; Genaro, Donald M.; McGarvey, John N.; Sampson, Craig F.; and Zambelli, Michael P., 276,228, Cl. D14-60.000.
Dix, Willard A.; Sylvester, Gordon E.; and Warren, Joe E., 276,232, Cl. D14-106.000.

Attention Team No. 1 AB: *See*—
Landgren, Per-Olof, 276,281, Cl. D34-44.000.

Austin, John J., Jr., to Champion International Corporation. Carton blank. 276,217, 11-6-84, Cl. D9-433.000.

Baldwin, Brian E.; and Styers, James D., to Baxa Corporation. Seal for a container cap or outlet port. 276,218, 11-6-84, Cl. D9-499.000.

Bankier, Jack D. Pedicure instrument. 276,276, 11-6-84, Cl. D28-59.000.

Banks, John D.; and St. Onge, Joseph G., to Gould Inc. Local area computer network interface housing. 276,234, 11-6-84, Cl. D14-107.000.

Bartley, Keith D.; Genaro, Donald M.; McGarvey, John N.; Sampson, Craig F.; and Zambelli, Michael P., to AT&T Bell Laboratories. Housing for a wall telephone stand. 276,228, 11-6-84, Cl. D14-60.000.

Basic Line, Inc.: *See*—
Licari, Yaffa, 276,198, Cl. D6-555.000.

Bass, Larry I.: *See*—
Caflisch, Jerry A.; Lee, Conrad E.; and Bass, Larry I., 276,241, Cl. D16-34.000.

Bass, Warren D.: *See*—
Masten, Billy F.; and Bass, Warren D., 276,210, Cl. D8-40.000.

Baxa Corporation: *See*—
Baldwin, Brian E.; and Styers, James D., 276,218, Cl. D9-499.000.

Beardsley, Michael L., to Marsellus Casket Co., Inc. Burial casket. 276,283, 11-6-84, Cl. D99-7.000.

Beckman Instruments, Inc.: *See*—
Boris, Michael J., 276,264, Cl. D24-8.000.
Boris, Michael J., 276,265, Cl. D24-8.000.
Boris, Michael J., 276,266, Cl. D24-8.000.
Boris, Michael J., 276,267, Cl. D24-8.000.
Boris, Michael J., 276,268, Cl. D24-8.000.
Boris, Michael J., 276,269, Cl. D24-8.000.
Boris, Michael J., 276,270, Cl. D24-8.000.
Boris, Michael J., 276,271, Cl. D24-8.000.

Berfield, Robert C.: *See—*
Miller, Jonathan; Wacek, Rudolph W.; and Berfield, Robert C., 276,279, Cl. D32-22.000.
Bezanson, Roni; and Kane, Joanne, to Merit Company, The. Beaded barrette or similar article. 276,274, 11-6-84, Cl. D28-42.000.
Bonnefoy, Francis, to Posso S.A. Slide viewer. 276,240, 11-6-84, Cl. D16-17.000.
Bore, Bjarne J. Feeder. 276,277, 11-6-84, Cl. D30-15.000.
Boris, Michael J., to Beckman Instruments, Inc. Fetal lung maturation tester. 276,264, 11-6-84, Cl. D24-8.000.
Boris, Michael J., to Beckman Instruments, Inc. Fetal lung maturation tester. 276,265, 11-6-84, Cl. D24-8.000.
Boris, Michael J., to Beckman Instruments, Inc. Fetal lung maturation tester. 276,266, 11-6-84, Cl. D24-8.000.
Boris, Michael J., to Beckman Instruments, Inc. Fetal lung maturation tester. 276,267, 11-6-84, Cl. D24-8.000.
Boris, Michael J., to Beckman Instruments, Inc. Fetal lung maturation tester. 276,268, 11-6-84, Cl. D24-8.000.
Boris, Michael J., to Beckman Instruments, Inc. Fetal lung maturation tester. 276,269, 11-6-84, Cl. D24-8.000.
Boris, Michael J., to Beckman Instruments, Inc. Fetal lung maturation tested. 276,270, 11-6-84, Cl. D24-8.000.
Boris, Michael J., to Beckman Instruments, Inc. Fetal lung maturation tester. 276,271, 11-6-84, Cl. D24-8.000.
Boston Manufacturing Company: *See—*
Glucksman, Dov Z., 276,258, Cl. D23-123.000.
Boyer Products, Inc.: *See—*
Heilner, Sanford J., 276,229, Cl. D14-65.000.
Broadway Industries, Inc.: *See—*
Miller, Charles D., 276,259, Cl. D23-25.000.
Brucoli, Michael N., to Holson Company, The. Portfolio type photographic album. 276,243, 11-6-84, Cl. D19-26.000.
Brunswick Corporation: *See—*
Robbins, Richard J., 276,254, Cl. D22-25.000.
Bulgari, Marina, to Marina B Creation Societe Anonyme. Bracelet. 276,221, 11-6-84, Cl. D11-3.000.
Burg, Klaus, to Procter & Gamble Company, The. Continuous sheet material or the like. 276,282, 11-6-84, Cl. D59-2.00B.
C. Erling Persson: *See—*
Larsson, Lars, 276,245, Cl. D20-27.000.
Caflisch, Jerry A.; Lee, Conrad E.; and Bass, Larry I., to Pako Corporation. Film processor. 276,241, 11-6-84, Cl. D16-34.000.
Champion International Corporation: *See—*
Austin, John J., Jr., 276,217, Cl. D9-433.000.
Curtin, James F. Tethering device. 276,278, 11-6-84, Cl. D30-44.000.
Custom Microdesign Limited: *See—*
Witts, Alan G.; and Wilshire, Philip St. C., 276,220, Cl. D10-41.000.
Dart Industries Inc.: *See—*
Goodin, John W.; and Patterson, Charlie A., 276,224, Cl. D13-12.000.
Wolff, Martin J., 276,201, Cl. D7-38.000.
Del Rosario, Luis. Loud speaker enclosure. 276,226, 11-6-84, Cl. D14-33.000.
DeVale, Donald P.; Wilbrandt, Howard B.; Tomlinson, Dennis E.; and Kubacki, Leonard J., to Industrial Design Electronic Associates, Inc. Front portion of a computer. 276,233, 11-6-84, Cl. D14-106.000.
Dix, Willard A.; Sylvester, Gordon E.; and Warren, Joe E., to AT&T Bell Laboratories. Video terminal with a hideaway keyboard. 276,232, 11-6-84, Cl. D14-106.000.
Dorman, Jaime E.; and Miller, A. Jack. Printer terminal console. 276,235, 11-6-84, Cl. D14-111.000.
Eliot, Joseph C. Tennis scorekeeper banner. 276,222, 11-6-84, Cl. D11-165.000.
Engelson, David, to Page Accessories, Inc. Belt. 276,191, 11-6-84, Cl. D2-387.000.
Fabian, Wolfgang, to American Standard Inc. Faucet. 276,257, 11-6-84, Cl. D23-25.000.
Frigard, Charles R.; Severson, Verne L.; Ursin, Thomas N.; Kluesner, Virgil A.; and Zimmerman, Fredric C., to Wordtronix Inc. Word processor. 276,231, 11-6-84, Cl. D14-106.000.
Fry, Alec. Combined toiletry container and dispenser. 276,214, 11-6-84, Cl. D9-315.000.
Fusco, Normajean. Brush or similar article. 276,192, 11-6-84, Cl. D4-120.000.
Gauldin, Robert A. Novelty toy mold. 276,248, 11-6-84, Cl. D21-59.000.
Genaro, Donald M.: *See—*
Bartley, Keith D.; Genaro, Donald M.; McGarvey, John N.; Sampson, Craig F.; and Zambelli, Michael P., 276,228, Cl. D14-60.000.
Glucksman, Dov Z., to Boston Manufacturing Company. Quartz heater. 276,258, 11-6-84, Cl. D23-123.000.
Goodin, John W.; and Patterson, Charlie A., to Dart Industries Inc. Electronic console for the remote control of burgular, smoke alarms and the like. 276,224, 11-6-84, Cl. D13-12.000.
Gould Inc.: *See—*
Banks, John D.; and St. Onge, Joseph G., 276,234, Cl. D14-107.000.
Hamilton Sorter Co., Inc.: *See—*
Kwiecinski, Alfred; and Yauger, Jon A., 276,199, Cl. D6-420.000.
Hayashi, Shigeaki: *See—*
Kosako, Mikio; Hayashi, Shigeaki; and Sakamoto, Harumi, 276,238, Cl. D16-32.000.
Hazenbroek, Jacobus E. Eviscerator tool. 276,209, 11-6-84, Cl. D7-368.000.
Heilner, Sanford J., to Boyer Products, Inc. Telephone shoulder rest. 276,229, 11-6-84, Cl. D14-65.000.
Hess, Robert. Shoe. 276,190, 11-6-84, Cl. D2-309.000.
Heweston, David I. Collapsible insulating container. 276,203, 11-6-84, Cl. D7-70.000.
Heweston, David I. Collapsible insulating container. 276,204, 11-6-84, Cl. D7-70.000.
Heweston, David I. Collapsible insulating container. 276,205, 11-6-84, Cl. D7-70.000.
Holson Company, The: *See—*
Brucoli, Michael N., 276,243, Cl. D19-26.000.
Honda, Akimoto: *See—*
Tanabe, Hiroki; Tobe, Hidetake; and Honda, Akimoto, 276,193, Cl. D4-104.000.
Industrial Design Electronic Associates, Inc.: *See—*
DeVale, Donald P.; Wilbrandt, Howard B.; Tomlinson, Dennis E.; and Kubacki, Leonard J., 276,233, Cl. D14-106.000.
Johnson & Johnson Dental Products Company: *See—*
Weissenburger, Edward A., 276,272, Cl. D24-10.000.
Kagan, Michael A.: *See—*
Shaftner, Robert F.; and Kagan, Michael A., 276,260, Cl. D23-123.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Michaud, John T., 276,216, Cl. D9-425.000.
Kallmyer, Raymond L. Forward viewing vehicle mirror. 276,223, 11-6-84, Cl. D12-189.000.
Kane, Joanne: *See—*
Bezanson, Roni; and Kane, Joanne, 276,274, Cl. D28-42.000.
Kaplan, S. David: *See—*
LaDuca, Anthony R.; and Kaplan, S. David, 276,208, Cl. D7-352.000.
Ki Mee Metal & Plastic Factory Ltd.: *See—*
Shun, So, 276,202, Cl. D7-47.000.
Kim, Syng N., to Wico Corporation. Cursor control. 276,247, 11-6-84, Cl. D21-48.000.
Kluesner, Virgil A.: *See—*
Frigard, Charles R.; Severson, Verne L.; Ursin, Thomas N.; Kluesner, Virgil A.; and Zimmerman, Fredric C., 276,231, Cl. D14-106.000.
Koehring Company: *See—*
Shaftner, Robert F.; and Kagan, Michael A., 276,260, Cl. D23-123.000.
Shaftner, Robert F., 276,261, Cl. D23-128.000.
Kosako, Mikio; Hayashi, Shigeaki; and Sakamoto, Harumi, to Sharp Corporation. Document feeder for copying machine. 276,238, 11-6-84, Cl. D16-32.000.
Kostynuik, Derryl. Vest. 276,189, 11-6-84, Cl. D2-190.000.
Kubacki, Leonard J.: *See—*
DeVale, Donald P.; Wilbrandt, Howard B.; Tomlinson, Dennis E.; and Kubacki, Leonard J., 276,233, Cl. D14-106.000.
Kwiecinski, Alfred; and Yauger, Jon A., to Hamilton Sorter Co., Inc. Work desk for a word processor unit. 276,199, 11-6-84, Cl. D6-420.000.
LaDuca, Anthony R.; and Kaplan, S. David, to Royal Copenhagen Cone Company, Inc. Electric baker for an ice cream cone or similar article. 276,208, 11-6-84, Cl. D7-352.000.
Landgren, Per-Olof, to Attention Team No. 1 AB. Basket. 276,281, 11-6-84, Cl. D34-44.000.
Larsson, Lars, to C. Erling Persson. Price tag blank. 276,245, 11-6-84, Cl. D20-27.000.
Leal, Vitervo. Fishing lure. 276,256, 11-6-84, Cl. D22-27.000.
Lee, Conrad E.: *See—*
Caflisch, Jerry A.; Lee, Conrad E.; and Bass, Larry I., 276,241, Cl. D16-34.000.
Lee, Peter, to Arrow Trading Co., Inc. Tool bit holder. 276,211, 11-6-84, Cl. D8-83.000.
Licari, Yaffa, to Basic Line, Inc. Rack for a wall-mounted telephone. 276,198, 11-6-84, Cl. D6-555.000.
Lindsley, Warren F. B.: *See—*
Smith, John N., 276,195, Cl. D6-324.000.
Lion Corporation: *See—*
Tanabe, Hiroki; Tobe, Hidetake; and Honda, Akimoto, 276,193, Cl. D4-104.000.
Lundin, Hans: *See—*
Nilsson, Gosta; and Lundin, Hans, 276,262, Cl. D23-151.000.
Mameet Co., Ltd.: *See—*
Murakami, Katsushi, 276,249, Cl. D21-128.000.
Murakami, Katsushi, 276,250, Cl. D21-128.000.
Marina B Creation Societe Anonyme: *See—*
Bulgari, Marina, 276,221, Cl. D11-3.000.
Marsellus Casket Co., Inc.: *See—*
Beardsley, Michael L., 276,283, Cl. D99-7.000.
Masten, Billy F.; and Bass, Warren D. Lid removing tool. 276,210, 11-6-84, Cl. D8-40.000.
McGarvey, John N.: *See—*
Bartley, Keith D.; Genaro, Donald M.; McGarvey, John N.; Sampson, Craig F.; and Zambelli, Michael P., 276,228, Cl. D14-60.000.
Merit Company, The: *See—*
Bezanson, Roni; and Kane, Joanne, 276,274, Cl. D28-42.000.
Michaud, John T., to Kaiser Aluminum & Chemical Corporation. Stackable packaging container. 276,216, 11-6-84, Cl. D9-425.000.
Miller, A. Jack: *See—*
Dorman, Jaime E.; and Miller, A. Jack, 276,235, Cl. D14-111.000.
Miller, Charles D., to Broadway Industries, Inc. Bar sink faucet. 276,259, 11-6-84, Cl. D23-25.000.
Miller, Jonathan; Wacek, Rudolph W.; and Berfield, Robert C., to Shop-Vac Corporation. Electric vacuum cleaner. 276,279, 11-6-84, Cl. D32-22.000.

Mitsuwa Kogyo Co., Ltd.: *See*—
Wakimura, Kazuo, 276,251, Cl. D21-134.000.
Mox, Dana W., to Tricolor Corporation. Kitchen timer. 276,219, 11-6-84, Cl. D10-40.000.
Murakami, Katsushi, to Mameet Co., Ltd. Simulative toy car. 276,249, 11-6-84, Cl. D21-128.000.
Murakami, Katsushi, to Mameet Co., Ltd. Simulative toy car. 276,250, 11-6-84, Cl. D21-128.000.
Nagelkerke, Petrus Jacobus J., to U.S. Philips Corporation. Dry shaver. 276,275, 11-6-84, Cl. D28-49.000.
Nakamura, Hitoshi, to Pioneer Electronic Corporation. Loudspeaker. 276,227, 11-6-84, Cl. D14-33.000.
Nilsson, Gosta; and Lundin, Hans. Air intake assembly. 276,262, 11-6-84, Cl. D23-151.000.
Padgett, John B. Gun rack. 276,196, 11-6-84, Cl. D3-38.000.
Padgett, John B. Gun rack. 276,197, 11-6-84, Cl. D3-38.000.
Page Accessories, Inc.: *See*—
Engelson, David, 276,191, Cl. D2-387.000.
Pako Corporation: *See*—
Caflisch, Jerry A.; Lee, Conrad E.; and Bass, Larry I., 276,241, Cl. D16-34.000.
Parduhn, A. Philip, to VePed Traffic Controls, Inc. Post anchor. 276,213, 11-6-84, Cl. D8-373.000.
Patterson, Charlie A.: *See*—
Goodin, John W.; and Patterson, Charlie A., 276,224, Cl. D13-12.000.
Pioneer Electronic Corporation: *See*—
Nakamura, Hitoshi, 276,227, Cl. D14-33.000.
Posso S.A.: *See*—
Bonnefoy, Francis, 276,240, Cl. D16-17.000.
Powel and Associates, Inc.: *See*—
Powel, Michael W. H., 276,225, Cl. D13-29.000.
Powel, Michael W. H., to Powel and Associates, Inc. Electrical connector. 276,225, 11-6-84, Cl. D13-29.000.
Procter & Gamble Company, The: *See*—
Burg, Klaus, 276,282, Cl. D59-2.00B.
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NOTE.—First number, class; second number, subclass; third number, patent number

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31 4,481,080

CLASS 204

15 4,481,081
38 A 4,481,083
38 B 4,481,082
42 4,481,084
70 4,481,085
78 4,481,086
95 4,481,087
98 4,481,088
129.43 4,481,089
129.75 4,481,090
157.1 R 4,481,091
158 R 4,481,092
159.19 4,481,093
180 G 4,481,094
224 M 4,481,095
265 4,481,096
290 F 4,481,097
297 W 4,481,098

CLASS 206

1.7 4,480,744
44 R 4,480,745
141 4,480,746
334 4,480,747
386 4,480,748
459 4,480,749
554 4,480,750
628 4,480,751
632 4,480,752

CLASS 208

11 LE 4,481,099
11 R 4,481,100
50 4,481,101
120 4,481,102
4,481,103
4,481,104
146 4,481,105
206 4,481,106
4,481,107

CLASS 209

546 4,480,753
683 4,480,754

CLASS 210

137 4,481,108
149 4,481,109
199 4,481,110
333.01 4,481,111
620 4,481,112
680 4,481,113
702 4,481,114
727 4,481,115
735 4,481,116
776 4,481,117
783 4,481,118

CLASS 211

60 T 4,480,755
126 4,480,756

CLASS 212

257 4,480,757

CLASS 213

54 4,480,758

CLASS 215

220 4,480,759
230 4,480,760
252 4,480,761
273 4,480,762

CLASS 219

10.55 B 4,481,393
4,481,394
4,481,396
10.55 E 4,481,392
4,481,395
10.61 R 4,481,397
10.69 4,481,398
60.2 4,481,399
73.1 4,481,400
91.2 4,481,401
137 R 4,481,402
209 4,481,403
398 4,481,404
405 4,481,405
411 4,481,406
457 4,481,407
460 4,481,408
518 4,481,409
521 4,481,410
532 4,481,411

CLASS 220

269 4,480,763

CLASS 221

11 4,480,764
211 4,480,765

CLASS 222

105 4,480,766
340 4,480,767
341 4,480,768
519 4,480,769
590 4,480,770
598 4,480,771

CLASS 223

1 4,480,772

CLASS 224

32 A 4,480,773
205 4,480,774
210 4,480,775
243 4,480,776

CLASS 226

15 4,480,777

CLASS 227

40 4,480,778

CLASS 228

112 4,480,779
180 A 4,480,780

CLASS 229

2.5 EC 4,480,781

CLASS 234

98 4,480,782

CLASS 235

472 4,481,412

CLASS 236

87 4,480,783
93 B 4,480,784

CLASS 237

6 4,480,785
78 R 4,480,786

CLASS 238

264 4,480,787

CLASS 239

14 4,480,788
116 4,480,789
214.25 4,480,790
533.15 4,480,791
533.6 4,480,792
567 4,480,793
654 4,480,794

CLASS 241

30 4,480,795
46.11 4,480,796
65 4,480,797

CLASS 242

18 R 4,480,798
25 R 4,480,799
55 4,480,800
56 R 4,480,801
84.2 G 4,480,803
84.2 R 4,480,802
107.2 4,480,804
157 R 4,480,805

CLASS 244

122 A 4,480,806
139 4,480,807

CLASS 248

73 4,480,808
185 4,480,809
238 4,480,810

CLASS 250

204 4,481,413
226 4,481,414
292 4,481,415
327.2 4,481,416
338 4,481,417
4,481,418
363 S 4,481,419
385 4,481,420
390 4,481,421
459.1 4,481,422
551 4,481,423

CLASS 251

14 4,480,811
87 4,480,812
288 4,480,813
292 4,480,814
298 4,480,815

CLASS 252

2 4,481,119
8.5 A 4,481,120
8.5 M 4,481,121
32.7 E 4,481,122
52 R 4,481,123
62 4,481,124
75 4,481,125
174.23 4,481,126
182 4,481,127
182.1 4,481,128
186.41 4,481,129
328 4,481,130
511 4,481,131
519 4,481,132
522 R 4,481,133
628 4,481,134
632 4,481,135

CLASS 254

264 4,480,816
332 4,480,817
411 4,480,818

CLASS 256

1 4,480,819

CLASS 260

112 R 4,481,136
4,481,137
112.5 R 4,481,138
4,481,139
243.3 4,481,142
397.45 4,481,144
399 4,481,140
405.6 4,481,145
410.9 R 4,481,146
4,481,147
465 D 4,481,149
465.4 4,481,148
513 N 4,481,150
543 P 4,481,151

CLASS 261

35 4,481,152
44 A 4,481,153
94 4,481,154
4,481,155
111 4,481,156

CLASS 264

4.1 4,481,157
22 4,481,158
26 4,481,159
135 4,481,160
328.8 4,481,161
334 4,481,162
513 4,481,163

CLASS 266

44 4,480,820
54 4,480,821
256 4,480,822

CLASS 267

91 4,480,823

CLASS 271

3.1 4,480,824
81 4,480,825
103 4,480,826
111 4,480,827

CLASS 272

70 4,480,828
116 4,480,829
117 4,480,830
128 4,480,831
130 4,480,832

CLASS 273

85 B 4,480,833
85 E 4,480,834
148 B 4,480,835
248 4,480,836
252 4,480,837
256 4,480,838
258 4,480,839
292 4,480,840

CLASS 277

1 4,480,841
22 4,480,842
31 4,480,843
235 B 4,480,844

CLASS 280

5 A 4,480,845
87.02 W 4,480,846
270 4,480,847
281 LP 4,480,848
433 4,480,849
630 4,480,850
656 4,480,851
663 4,480,852
801 4,480,853
4,480,854

CLASS 285

3 4,480,855
5 4,480,856
45 4,480,857
114 4,480,858
163 4,480,859
177 4,480,860
334.2 4,480,861

CLASS 290

38 R 4,481,424
51 4,481,425

CLASS 292

162 4,480,862
216 4,480,863
341.18 4,480,864

CLASS 294

87 R 4,480,865

CLASS 296

21 4,480,866
65 R 4,480,867
190 4,480,868
217 4,480,869

CLASS 297

216 4,480,870

CLASS 298

22 J 4,480,871

CLASS 299

56 4,480,872
87 4,480,873
91 4,480,874

CLASS 303

38 4,480,875
103 4,480,876
116 4,480,877

CLASS 307

91 4,481,426
200 A 4,481,427
219.1 4,481,428
296 R 4,481,429
4,481,430
300 4,481,431
469 4,481,432
546 4,481,433
570 4,481,434

CLASS 308

3.8 4,480,878
6 C 4,480,879
6 R 4,480,880
189 A 4,480,881

CLASS 310

71 4,481,435
4,481,436
191 4,481,437
201 4,481,438
233 4,481,439
268 4,481,440

CLASS 312

107 4,480,882
220 4,480,883

CLASS 313

481 4,481,441
493 4,481,442
636 4,481,443

CLASS 315

3.6 4,481,444
14 4,481,445
73 4,481,446
101 4,481,447

CLASS 318

248 4,481,448
375 4,481,449
444 4,481,450
628 4,481,451
681 4,481,452
696 4,481,453
4,481,454
778 4,481,455
800 4,481,456
803 4,481,457

CLASS 320

2 4,481,458

CLASS 322

10 4,481,459

CLASS 323

266 4,481,460
272 4,481,461
274 4,481,462
315 4,481,463

CLASS 324

57 PS 4,481,464
60 CD 4,481,465
71.1 4,481,466
72.5 4,481,467
163 4,481,468
174 4,481,469
228 4,481,470
240 4,481,471
339 4,481,472
423 4,481,473
425 4,481,474

CLASS 328

237 4,481,475
270 4,481,476

CLASS 330

2 4,481,477
253 4,481,478
265 4,481,479
294 4,481,480
296 4,481,481
297 4,481,482
4,481,483

CLASS 331

12 4,481,484
66 4,481,485
99 4,481,486
117 D 4,481,487
158 4,481,488

CLASS 332

19 4,481,489
41 4,481,490

CLASS 335

21 4,481,491
22 B1 3,671,890
164 4,481,492
179 4,481,493

CLASS 337

95 4,481,494
159 4,481,495
213 4,481,496

CLASS 338

2 4,481,497
20 4,481,498
34 4,481,499

CLASS 339

17 L 4,480,884
45 M 4,480,885
74 R 4,480,888
75 MP 4,480,886
94 C 4,480,887
99 R 4,480,889
113 R 4,480,890
147 P 4,480,891

CLASS 340

310 R 4,481,501
516 4,481,502
518 4,481,503
573 4,481,504
601 4,481,505
630 4,481,506
679 4,481,507
712 4,481,508
728 4,481,509
752 4,481,511
784 4,481,510
825.25 4,481,512
825.31 4,481,513
870.1 4,481,514
912 4,481,515
933 4,481,516

CLASS 343

5 NA 4,481,517
434 4,481,519

CLASS 346

76 PH 4,481,518
140 R 4,481,520

CLASS 350

3.71 4,480,892
96.30 4,480,897
4,480,898

132 4,480,893
167 4,480,894
356 4,480,899
431 4,480,896
623 4,480,895

CLASS 354

234.1 4,480,900
320 4,480,901
434 4,480,902
465 4,480,903
479 4,480,904

CLASS 355

3 DD 4,480,905
4,480,911
3 R 4,480,906
10 4,480,907
14 CH 4,480,909
14 FU 4,480,908
30 4,480,910

CLASS 356

138 4,480,912
319 4,480,913
346 4,480,914
350 4,480,915
351 4,480,916
364 4,480,917
373 4,480,918
376 4,480,919
4,480,920
434 4,480,921

CLASS 357

23 4,481,521
4,481,527
24 4,481,522
30 4,481,523
42 4,481,524
81 4,481,525
84 4,481,526

CLASS 358

30 4,481,529
44 4,481,530
60 4,481,531
75 4,481,528
80 4,481,532
101 4,481,533
107 4,481,534
113 4,481,535
147 4,481,536
162 4,481,537
213 4,481,538
4,481,539
227 4,481,540
244 4,481,541
331 4,481,542

CLASS 360

10.1 4,481,543
10.2 4,481,544
18 4,481,545
30 4,481,546
33.1 4,481,547
44 4,481,548
45 4,481,549
77 4,481,550
85 4,481,551
97 4,481,552

CLASS 361

93 4,481,553
152 4,481,554
155 4,481,555
222 4,481,556
235 4,481,557
303 4,481,558
395 4,481,559

CLASS 362

84 4,481,560
111 4,481,561
183 4,481,562
296 4,481,563

CLASS 363

21 4,481,564
56 4,481,565
60 4,481,566

CLASS 364

157 4,481,567
167 4,481,568
183 4,481,569
200 4,481,570
4,481,571
4,481,572
4,481,573
4,481,574
4,481,575
4,481,576
4,481,577
4,481,578
4,481,579
4,481,580
4,481,581
4,481,582

300 4,481,583
424 4,481,584
4,481,585
434 4,481,586
466 4,481,587
474 4,481,588
4,481,589
479 4,481,590
513 4,481,591
4,481,592
513.5 4,481,593
521 4,481,594
562 4,481,595
571 4,481,596
604 4,481,597
710 4,481,598
4,481,599
719 4,481,605
765 4,481,600
815 4,481,601
900 4,481,602
4,481,603
4,481,604
4,481,606
4,481,607
4,481,608

CLASS 365

72 4,481,609
182 4,481,610

CLASS 366

25 4,480,922
99 4,480,923
102 4,480,924
107 4,480,925
251 4,480,926
299 4,480,927

CLASS 367

19 4,481,611
75 4,481,612

CLASS 369

43 4,481,614
50 4,481,615
56 4,481,613
58 4,481,616
77.2 4,481,617
194 4,481,618
270 4,481,619
275 4,481,620

CLASS 370

3 4,481,621
30 4,481,622
60 4,481,623
62 4,481,624
85 4,481,625
4,481,626

CLASS 371

21 4,481,627
28 4,481,628
57 4,481,629

CLASS 372

38 4,481,630
45 4,481,631
58 4,481,632
62 4,481,633
87 4,481,634
94 4,481,635

CLASS 373

18 4,481,636
93 4,481,500
97 4,481,637
98 4,481,638
150 4,481,639

CLASS 374

5 4,480,928
53 4,480,929
134 4,480,930

CLASS 375

1 4,481,640
7 4,481,641
9 4,481,642
12 4,481,643
27 4,481,644
58 4,481,645
77 4,481,646
107 4,481,647
119 4,481,648

CLASS 376

233 4,481,164
272 4,481,165

CLASS 377

19 4,481,649

CLASS 378

7 4,481,650
22 4,481,651
69 4,481,652
85 4,481,653

110 4,481,654
125 4,481,655
196 4,481,656
209 4,481,657

CLASS 381

14 4,481,658
31 4,481,659
58 4,481,660
61 4,481,661
98 4,481,662
4,481,663

CLASS 382

8 4,481,664
48 4,481,665
53 4,481,666
65 4,481,667

CLASS 383

7 4,481,668
94 4,481,669

CLASS 400

63 4,480,931
82 4,480,932
120 4,480,933
124 4,480,934
145.2 4,480,935
207 4,480,936
322 4,480,938
479 4,480,937

CLASS 401

201 4,480,939
206 4,480,940

CLASS 403

232.1 4,480,941

CLASS 405

154 4,480,942
172 4,480,943
223 4,480,944
262 4,480,945
293 4,480,946

CLASS 406

14 4,480,947
52 4,480,948

CLASS 407

54 4,480,949
103 4,480,950

CLASS 408

224 4,480,951
4,480,952

CLASS 414

27 4,480,953
383 4,480,954
723 4,480,955

CLASS 416

97 A 4,480,956
220 R 4,460,957
4,480,958
4,480,959

CLASS 417

12 4,480,960
15 4,480,961
53 4,480,962
216 4,480,963
222 4,480,964
274 4,480,965
332 4,480,966
368 4,480,967
380 4,480,968
393 4,480,969

CLASS 418

15 4,480,970
61 B 4,480,971
4,480,972
150 4,480,973

CLASS 419

16 4,481,166

CLASS 422

29 4,481,167
78 4,481,168
110 4,481,169
168 4,481,170
176 4,481,171

CLASS 423

242 4,481,172
277 4,481,173
306 4,481,174
308 4,481,175
322 4,481,176
329 4,481,177
342 4,481,178
346 4,481,179
446 4,481,180
573 G 4,481,181
644 4,481,182
4,481,183

CLASS 424

1.1 4,481,184
59 4,481,185
4,481,186
63 4,481,187
89 4,481,188
101 4,481,189
177 4,481,190
4,481,191
4,481,192
4,481,193
4,481,194
180 4,481,195
4,481,196
4,481,197
236 4,481,198
246 4,481,199
248.5 4,481,200
250 4,481,201
4,481,202
251 4,481,203
262 4,481,204
263 4,481,205
267 4,481,206
4,481,207
269 4,481,208
271 4,481,209
4,481,210
273 R 4,481,211
275 4,481,212
283 4,481,213
4,481,214
298 4,481,215
300 4,481,216
311 4,481,217
316 4,481,218
319 4,481,219
349 4,481,220

CLASS 425

112 4,480,974
116 4,480,975
131.1 4,480,980
143 4,480,981
186 4,480,976
192 S 4,480,977
371 4,480,978
385 4,480,982
403 4,480,979
467 4,480,983
508 4,480,984

CLASS 426

3 4,481,221
62 4,481,222
422 4,481,223
535 4,481,224
538 4,481,225
540 4,481,226

CLASS 427

2 4,481,227
31 4,481,228
38 4,481,229
39 4,481,230
44 4,481,231
51 4,481,232
68 4,481,233
71 4,481,234
74 4,481,235
97 4,481,236
376.4 4,481,237

CLASS 428

35 4,481,238
36 4,481,239
95 4,481,240
134 4,481,241
136 4,481,242
154 4,481,243
155 4,481,244
192 4,481,245
210 4,481,246
234 4,481,247
283 4,481,248
288 4,481,249
290 4,481,250
312.6 4,481,251
323 4,481,252
4,481,253
329 4,481,254
355 4,481,255
362 4,481,256
366 4,481,257
371 4,481,258
377 4,481,259
398 4,481,260
429 Re.31,727
434 4,481,261
441 4,481,262
620 4,481,263
627 4,481,264

CLASS 429

9 4,481,265
12 4,481,266

121 4,481,269
194 4,481,267

CLASS 430

17 4,481,268
55 4,481,270
57 4,481,271
58 4,481,272
59 4,481,273
109 4,481,274
125 4,481,275
218 4,481,277
225 4,481,278
280 4,481,279
281 4,481,276
4,481,280
284 4,481,281
303 4,481,282
319 4,481,283
355 4,481,284
410 4,481,285
441 4,481,286
483 4,481,287
506 4,481,288
532 4,481,289
543 4,481,290

CLASS 431

1 4,480,985
37 4,480,986
304 4,480,987
329 4,480,988

CLASS 432

1 4,480,989
9 4,480,990
14 4,480,991
18 4,480,992
266 4,480,993

CLASS 433

6 4,480,994
54 4,480,995
164 4,480,996
221 4,480,997
225 4,480,998

CLASS 434

18 4,480,999
20 4,481,000
267 4,481,001

CLASS 435

6 4,481,291
147 4,481,292
167 4,481,293
259 4,481,294

CLASS 436

66 4,481,295
163 4,481,296
181 4,481,297
500 4,481,298

CLASS 440

9 4,481,002

CLASS 445

49 4,481,003

CLASS 446

188 4,480,400
456 4,480,401

CLASS 455

33 4,481,670
92 4,481,671
108 4,481,672
180 4,481,673
231 4,481,674
343 4,481,675
608 4,481,676
617 4,481,677
619 4,481,678

CLASS 474

28 4,481,004
139 4,481,005

CLASS 493

194 4,481,006
444 4,481,007

CLASS 501

73 4,481,299
98 4,481,300

CLASS 502

104 4,481,301
150 4,481,302
159 4,481,303
209 4,481,304

CLASS 518

705 4,481,305

CLASS 521

31 4,481,306
115 4,481,307

120 4,481,308
172 4,481,309

CLASS 523

144 4,481,310
424 4,481,311

CLASS 524

40 4,481,312
84 4,481,313
88 4,481,314
89 4,481,315
93 4,481,316
119 4,481,317
211 4,481,318
213 4,481,319
239 4,481,320
243 4,481,321
265 4,481,322
269 4,481,323
312 4,481,324
320 4,481,325
377 4,481,326
432 4,481,327
493 4,481,328
501 4,481,329

CLASS 525

67 4,481,330
92 4,481,331
132 4,481,332
192 4,481,333
211 4,481,334
261 4,481,335
323 4,481,336
340 4,481,337
394 4,481,338
424 4,481,339
426 4,481,340
478 4,481,341

CLASS 526

125 4,481,342
255 4,481,343
283 4,481,344

CLASS 528

59 4,481,345
73 4,481,346
102 4,481,347
103 4,481,348
120 4,481,349
167 4,481,350
272 4,481,351
302 4,481,352
303 4,481,353
487 4,481,354

CLASS 534

700 4,481,141

CLASS 536

2 4,481,355

CLASS 544

99 4,481,358
016 4,481,357

CLASS 546

114 4,481,359
210 4,481,360
251 4,481,361

CLASS 548

264 4,481,356
498 4,481,362

CLASS 549

260 4,481,363

CLASS 556

413 4,481,364
422 4,481,365
431 4,481,366

CLASS 560

026 4,481,367

CLASS 562

406 4,481,368
4,481,369

CLASS 564

394 4,481,370
406 4,481,371

CLASS 568

378 4,481,372
401 4,481,373
432 4,481,374
454 4,481,375

CLASS 585

640 4,481,376
646 4,481,377

CLASS 604

118 4,481,008

CLASSIFICATION OF DESIGNS

D2—	190	276,189
	309	276,190
	387	276,191
D3—	38	276,196
		276,197
D4—	104	276,193
	120	276,192
D6—	324	276,195
	420	276,199
	512	276,194
	555	276,198
D7—	13	276,200
	38	276,201
	47	276,202
	70	276,203
		276,204
		276,205
	72	276,206
	328	276,207
	352	276,208
	368	276,209
D8—	40	276,210
	83	276,211
	373	276,212
		276,213
D9—	315	276,214
	415	276,215
	425	276,216
	433	276,217
	499	276,218
D10—	40	276,219
	41	276,220
D11—	3	276,221
	165	276,222
D12—	189	276,223
D13—	12	276,224
	29	276,225
D14—	33	276,226
		276,227
	60	276,228
	65	276,229
	100	276,230
	106	276,231
		276,232
		276,233
	107	276,234
	111	276,235
	113	276,236
D15—	70	276,237
D16—	17	276,240
	32	276,238
	34	276,241
	38	276,239
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